Installation and Operations Manual

Tandberg DLT1 Tape Drive
Tandberg DLT7 Autoloader

TANDBERG DATA

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TANDBERG DLT1
Tape Drive

TANDBERG DLT7
Autoloader

INSTALLATION AND OPERATIONS MANUAL

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We would appreciate any comments on this publication.

Table of Contents

1. Introduction 1-1

1.1. Chapter Overview 1
1.2. Tandberg DLT1 Drive Overview 1
1.2.1. Fast Data Transfer 1
1.2.2. High Capacity 1
1.2.3. Data Compaction 1
1.2.4. Durable Media 2
1.2.5. Compatibility 2
1.2.6. Firmware Update Capability 2
1.2.7. Embedded Diagnostics 2
1.3. Tandberg DLT7 Autoloader Overview 2
1.4. Scope of This Guide 2

2. Installing and Configuring Your Tandberg DLT1 Drive 2-1

2.1. Chapter Overview 1
2.2. Preparation 1
2.2.1. SCSI Requirements 1
2.2.2. Before You Start 1
2.3. Installing Your Tandberg DLT1 Desktop Drive 1
2.3.1. Installation Overview 2
2.3.2. Unpacking your Drive and Selecting a Location 2
2.3.2.1 Unpacking your Drive 2
2.3.2.2. Selecting a Location for your Drive 3
2.3.3. Configuration 3
2.3.3.1. Setting the SCSI ID 3
2-3-3-2- When to Use Termination 4
2.3.4. Connecting the Cables 5
2.4. Installing Your Tandberg DLT1 Internal Drive 7
2.4.1. Installation Overview 7
2.4.2. Unpacking your Drive 7
2.4.2.1. Unpacking your Drive 7
2.4.3. Configuration 8
2.4.3.1. Setting the SCSI ID 8
2.4.3.2. When to Use Termination 10
2.4.4. Installing Your Tandberg DLT1 Drive 11
2.5. Testing Your Tandberg DLT1 Drive 15
2.5.1. What to do if POST Fails 15

3. Using Your Tandberg DLT1 Tape Drive 3-1

3.1. Chapter Overview 1
3.2. Front Panel Controls and Indicators 1
3.2.1. Key to Indicators 1
3.2.1.1. Indicator Activity During Power-On Self-Test (POST) 1
3.2.1.2. Indicator Activity During Drive Operation 2
3.3. Using Cartridges 3
3.3.1. Loading a Cartridge 3
3.3.2. Ejecting a Cartridge 4
3.3.3. Cartridge Write-Protect Switch 4
3.3.4. Caring for your Cartridges 5
3.3.5. Using the Cleaning Cartridge 6

4. Installing and Using Your Tandberg DLT7 Autoloader 4-1

4.1. Chapter Overview 1
4.1.1. Product Introduction 1
4.1.1.1. Rear Panel Connectors 2
4.1.1.2. Front Panel Controls, Indicators 2
4.2. Installing Your Tandberg DLT7 Autoloader 4
4.2.1. Installation Overview 4
4.2.2. Unpacking Your Tandberg DLT7 Autoloader and Selecting a Location 4
4.2.2.1. Unpacking your Autoloader 5
4.2.2.2. Selecting a Location for your Autoloader 5
4.2.2.3. SCSI Requirements 6
4.2.3. Configuration 6
4.2.3.1. When to Use Termination 6
4.2.4. Connecting the SCSI Cable(s) 6
4.2.5. Turning on Your Tandberg DLT7 Autoloader for the First Time 7
4.2.6. Setting the SCSI IDs 8
4.3. Using Your Tandberg DLT7 Autoloader 9
4.3.1. General Use Guidelines 9
4.3.2. Turning Your Tandberg DLT7 Autoloader On and Off 9
4.3.2.1. Turning On Your Tandberg DLT7 Autoloader 10
4.3.2.2. Power-On Checks 10
4.3.2.3. Turning Off Your Tandberg DLT7 Autoloader 10
4.3.3. Preparing and Installing DLTtape Cartridges 10
4.3.4. Drive Status Messages 12
4.4. Tandberg DLT7 Autoloader Manual Control Modes 13
4.4.1. Mode 1A – LOAD DRV 13
4.4.2. Mode 1B – EJECT DRV 13
4.4.3. Mode 2 – LOAD SLOT 14
4.4.4. Mode 3 – EJECT SLOT 14
4.4.5. Mode 4 – EJECT PCKR 15
4.4.6. Mode 5 – DENSITY 15
4.4.7. Mode 6 – SET SCSI 15
4.5. Routine Maintenance 17
4.5.1. Cleaning the Drive Read/Write Head 17
4.5.1.1. Cleaning Cartridge 17
4.5.1.2. Automatic Read/Write Head Cleaning 18
4.5.1.3. Enabling AUTOCLEAN 18
4.5.1.4. Using AUTOCLEAN 19
4.5.1.5. Disabling AUTOCLEAN 20
4.5.1.6. Manual Read/Write Head Cleaning 20
4.5.2. Cleaning the Enclosure 21
4..6. Troubleshooting and Diagnostics 21
4.6.1. Installation Problems 21
4.6.2. Loader and Drive Operational Problems 22
4.6.3. Diagnostic Menu 23
4.6.3.1. DISPLAY FIRMWARE 24
4.6.3.2. SIGN ON 24
4.6.3.3. CHANGE MODE 25
4.6.3.4. CYCLE TEST 26
4.6.3.5. CLEAN DRIVE 26
4.6.3.6. AUTOCLEAN 27
4.6.3.7. Enabling AUTOCLEAN 27
4.6.3.8. Using AUTOCLEAN 28
4.6.3.9. Disabling AUTOCLEAN 29

4.6.3.10. LOAD FIRMWARE 29
4.6.3.11. DISPLAY COUNTS 29
4.6.3.12. UPGRADE DRIVE FIRMWARE 31
4.7. TandbergDLT Autoloader Error Messages 31
4.7.1. Error Message Listing 32

5. Updating Your Drive Firmware 5-1

5.1. Chapter Overview 1
5.2. Firmware Update Overview 1
5.3. Creating a Code Update Cartridge 1
*5.3.1. UN*X Systems 1*
5.4. Updating the Firmware 2
5.4.1. Code Upgrade Troubleshooting 3

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1. Introduction

1.1. Chapter Overview

This chapter introduces your Tandberg DLT1 Drive, both internal and desktop versions, the Tandberg DLT7 Autoloader, and this *Installation and Operation Guide*.

1.2. Tandberg DLT1 Drive Overview

Your Tandberg DLT1 Drive is a high-performance, high-capacity streaming cartridge tape drive designed for use on mid-range and high-end computing platforms. With a combination of data compression and compaction, your Tandberg DLT1 drive offers a formatted cartridge capacity of 40GB (80GB assuming a 2:1 compression ratio) and a sustained user data transfer rate of 3MB/s (6MB/s with compression). The capacity you realize in practice depends on the data set, which affects the actual compression ratio.

Your Tandberg DLT1 drive is built on a 5-¼ inch, full-height form-factor, using a ½-inch tape. Its design includes a dual-channel read/write head, Lempel-Ziv (DLZ) high-efficiency data compression, and tape-mark directory to achieve the fastest data throughput and data access times.

1.2.1. *Fast Data Transfer*

Whether you use your Tandberg DLT1 drive for unattended backups or archiving, the data transfer rate your drive achieves is higher than many competing products. Your Tandberg DLT1 drive's native (uncompressed) data transfer rate is 3.0MB/s. With data compression, the data transfer rate increases to 6.0MB/s.

1.2.2. *High Capacity*

Your Tandberg DLT1 drive uses of DLTtape™ IV cartridges, which offer 40GB of native storage or up to 80GB of compressed data.

As always, the data set determines the actual data compression rate, which may vary from the average of 2:1.

Use your backup application to turn data compression on or off.

1.2.3. *Data Compaction*

Your Tandberg DLT1 drive includes a data compaction feature that helps it store data efficiently. A read/write buffer of up to 2MB provides working space for the compaction feature, allowing you to get the most of the available tape space.

1.2.4. Durable Media

The tape media is designed to endure 1,000,000 passes and has a shelf life of 30 years, providing superior media durability and data reliability.

1.2.5. Compatibility

Your Tandberg DLT1 drive is read-compatible with DLT4000 using DLTtape IV cartridges.

1.2.6. Firmware Update Capability

Your Tandberg DLT1 drive includes Flash EEPROM technology that makes on-site firmware (microcode) updates from tape or SCSI bus fast and easy.

1.2.7. Embedded Diagnostics

Your Tandberg DLT1 drive has embedded diagnostic software that indicates diagnostic results and drive operating status and even tells you when head cleaning is needed. The drive also has embedded error logging to help you diagnose any problems.

1.3. Tandberg DLT7 Autoloader Overview

Your Tandberg DLT7 Autoloader is a SCSI-2 compatible data storage device that incorporates a Tandberg DLT1 drive featuring high capacity, high throughput, and data compression. Your Tandberg DLT7 Autoloader operates as two SCSI devices on a single SCSI bus, one device for the tape drive, the other for the autoloader robotics. Your Tandberg DLT7 Autoloader can contain up to seven DLTtape IV data cartridges providing a maximum formatted capacity of 280GB native or 560GB compressed and a sustained data transfer rate as high as 180MB per minute native or 360MB per minute compressed.

Your Tandberg DLT7 Autoloader is compatible with many operating systems and environments supporting the SCSI interface, but requires either direct support of the operating system or a suitable backup application to take advantage of its features. For an up-to-date list of compatible operating systems and backup applications, visit:

www.tandberg.com

1.4. Scope of This Guide

This *Installation and Operations Guide* is intended to provide all the information you need to install and use your Tandberg DLT1 desktop or internal drive and optional Tandberg DLT7 Autoloader.

2. Installing and Configuring Your Tandberg DLT1 Drive

2.1. Chapter Overview

This chapter explains how to install and configure your Tandberg DLT1 Drive, both desktop and internal versions. Installation and configuration is not difficult and requires only that you follow the steps and instructions presented in this chapter.

2.2. Preparation

This section explains how to prepare to install your Tandberg DLT1 desktop or internal drive.

2.2.1. SCSI Requirements

Your Tandberg DLT1 drive (internal and desktop) requires a wide, SCSI-3, Low-Voltage Differential (LVD), single-ended SCSI bus. Make sure your SCSI host adapter or controller supports these standards. If you connect your Tandberg DLT1 drive to a Single-Ended (SE) SCSI bus, the drive's performance is limited by the maximum data transfer speed of the SE bus.

2.2.2. Before You Start

Installing your Tandberg DLT1 desktop Drive requires no special tools. You will need a ballpoint pen to change the SCSI ID switch on the rear panel of the drive.

Installing your Tandberg DLT1 internal drive requires only the usual tools needed to install an internal drive in the computer you have chosen to house the Tandberg DLT1 drive.

If you are installing a Tandberg DLT1 Desktop Drive, refer to page 2- 1 for instructions.

If you are installing a Tandberg DLT1 internal drive, refer to page 2- 7 for instructions.

2.3. Installing Your Tandberg DLT1 Desktop Drive

This section contains step-by-step instructions for installing your Tandberg DLT1 Desktop Drive.

2.3.1. Installation Overview

Installing your Tandberg DLT1 Desktop Drive is fast and easy when you follow the instructions in this section in the order presented. Installing your Tandberg DLT1 Desktop Drive consists of the following steps:

1. Unpack and check your drive for shipping damage.
2. Select a location near the server or workstation that is to be the host for your Tandberg DLT1 Desktop Drive.
3. Set the SCSI ID for your Tandberg DLT1 Desktop Drive.
4. Shut down and turn off the server or workstation that is to be the host for your Tandberg DLT1 Desktop Drive. Remove the power cable from the selected server or workstation. Turn off and remove the power cables from all devices attached to the selected server or workstation.
5. Install a SCSI host adapter in the server or workstation that is to be the host for your drive, if necessary.
6. Attach the SCSI cable to your Tandberg DLT1 Desktop Drive and SCSI host adapter.
7. Install the terminator on your Tandberg DLT1 Desktop Drive if it is the last or only device on the SCSI bus.
8. Attach the power cable to your Tandberg DLT1 Desktop Drive and plug in the power cable to the nearest power outlet.
9. Check your Tandberg DLT1 Desktop Drive to make sure it is working properly.

Each of these steps is covered in the next few sections.

2.3.2. Unpacking your Drive and Selecting a Location

Before you begin, you need to clear a desk or table so that you can unpack your Tandberg DLT1 Desktop Drive. You also need to select a location near the server or workstation that is to be the host for your drive.

2.3.2.1 Unpacking your Drive

Before you do anything else, unpack and inspect your Tandberg DLT1 Desktop Drive for shipping damage. To do a thorough job, follow these steps:

1. Clear a table or desk so that you have room to unpack your drive.
2. Inspect the shipping box for damage. If you notice any damage, report it to the shipping company immediately.
3. Open the shipping box and remove the accessories package. Set the accessories package aside for now.
4. With the drive still in the shipping box, reach under and around the drive, carefully lift it out of the shipping, and place it on the work surface, top facing up. Do not stand the drive on either end.
5. Carefully remove the remove the drive from the anti-static bag.
6. Open the accessories package so that the accessories are handy during installation.

2.3.2.2. Selecting a Location for your Drive

Select a location for your Tandberg DLT1 Desktop Drive that is flat, sturdy, level, and close to the host server or workstation. A desk or table top is most suitable. Regardless of the location you choose for your Tandberg DLT1 Desktop Drive, make sure the environment is free from dust and excessive humidity. See the *Tandberg DLT1 Reference Manual* manual for acceptable operating humidity limits.

Be sure to follow these additional guidelines when selecting a location for your Tandberg DLT1 Desktop Drive:

- Allow at least 6 inches (15.2 cm) behind the drive for proper cooling.
- Avoid locations near printers or photo copy machines, both of which produce paper fiber and other types of dust and airborne contaminants.
- Do not place your drive on the floor.
- Avoid locations near generators, electric motors, audio speakers, or other sources of magnetic fields. Magnetic fields can adversely affect your drive and media.

2.3.3. Configuration

Configuring your Tandberg DLT1 Desktop Drive is fast and easy. You only need to select a unique SCSI ID and decide if your drive needs to be terminated. The following sections explain how to configure your drive.

2.3.3.1. Setting the SCSI ID

Regardless of the number of SCSI devices attached to the server or workstation that is to be the host for your Tandberg DLT1 Desktop Drive, each must have a unique SCSI ID. Check the SCSI IDs on all other SCSI devices on the selected server or workstation, including the SCSI host adapter, and select an unused SCSI ID for your Tandberg DLT1 Desktop Drive. If the factory default SCSI ID is not being used, you do not need to change the drive's SCSI ID.

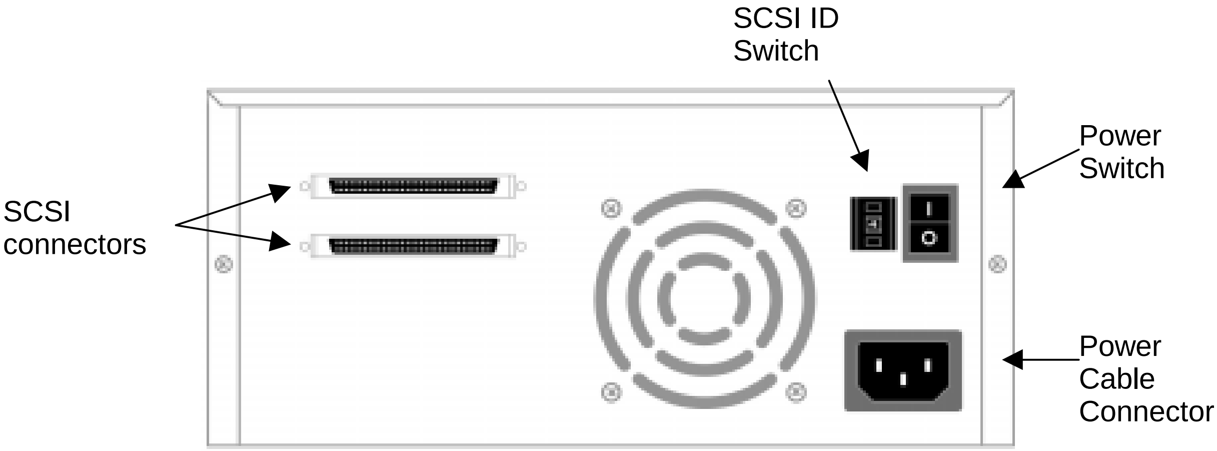


Figure 2.1: Tandberg DLT1 Desktop Drive Rear Panel Layout

To set the SCSI ID on your Tandberg DLT1 Desktop Drive, use a small screwdriver or ballpoint pen to press the button above the SCSI ID display to select the next higher SCSI ID. Press the button below the SCSI ID display to select the next lower SCSI ID. Each time you press one of these buttons, the SCSI ID increases or decreases by one. Press the appropriate button until the desired SCSI ID appears on the switch display.

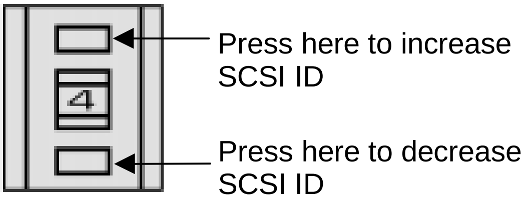

4
Press here to increase SCSI ID
Press here to decrease SCSI ID

Figure 2-2: SCSI ID Switch

2-3-3-2- When to Use Termination

If your Tandberg DLT1 Desktop Drive is the only SCSI device – other than the SCSI host adapter – on the selected server or workstation, it must be terminated. Likewise, if your Tandberg DLT1 Desktop Drive is the last device on the selected server or workstation's SCSI bus, it must be terminated.

To terminate your Tandberg DLT1 Desktop Drive, locate the terminator in the accessories package and press it firmly into either of the two SCSI connectors on the rear panel of the drive. Secure the terminator by tightening the screws until snug or by snapping the wire bales into place.

2.3.4. Connecting the Cables

This is the final installation stage, which requires only that you attach the SCSI and power cables to your Tandberg DLT1 Desktop Drive.

NOTE:
If the selected server or workstation does not already have an installed SCSI host adapter, install one now.

To connect the SCSI and power cables to your Tandberg DLT1 Desktop Drive, follow these steps:

1. Before you continue, shut down the operating system and turn off the selected server or workstation. Turn off all attached accessory devices, such as printers and other SCSI devices. Remove the power cable from the host server or workstation and all attached accessory devices. Failure to follow these instructions may result in damage to your Tandberg DLT1 Desktop Drive or other devices.

Do not move on to step 2 until you have shut down the operating system and turned off the server or workstation that is to be the host for your Tandberg DLT1 Desktop Drive. Turn off all attached accessory devices, such as printers and other SCSI devices. Remove the power cables from the host server or workstation and all attached accessory devices**.**

2. Locate the SCSI cable in the accessories package.
3. Attach one end of the SCSI cable to one of the connectors on the rear panel of your Tandberg DLT1 Desktop Drive.
4. Attach the other end of the SCSI cable to the connector on your SCSI host adapter or to the connector on the previous SCSI device on the SCSI bus.

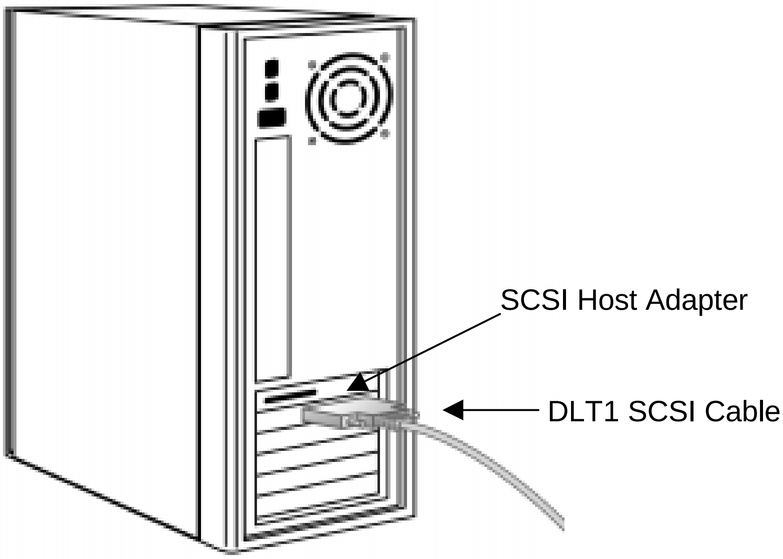


Figure 2-3: Attach SCSI Cable to Server or Workstation (if applicable)

1. Secure the SCSI cable connectors by tightening the screws until snug.
2. Make sure the power switch on the rear panel of your Tandberg DLT1 Desktop Drive is in the OFF position. Attach the female connector on the power cable to the power connector on the rear panel of the drive.

Use caution when plugging the power cord into an electrical outlet. Hazardous voltages are present in the sockets of the outlet.

3. Plug in the power cable to a nearby power outlet.

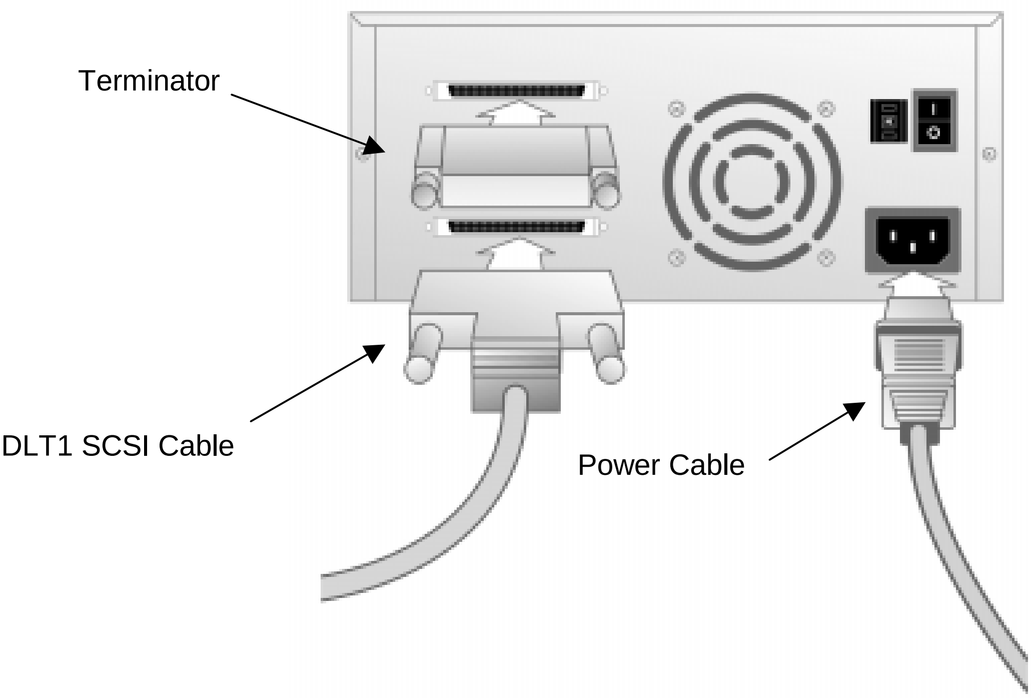


Figure 2-4: Attach Terminator (optional), SCSI, and Power Cables to your Drive

1. Attach the power cables to the host server or workstation and all attached devices.
2. Turn on your Tandberg DLT1 Desktop Drive.
3. Turn on the host server or workstation and allow its operating system to start.

Turn to page 2- 15 to learn about your Tandberg DLT1 Desktop Drive's self-test and initialization features.

2.4. Installing Your Tandberg DLT1 Internal Drive

This section contains step-by-step instructions for installing your Tandberg DLT1 internal drive.

2.4.1. Installation Overview

Installing your Tandberg DLT1 internal drive is fast and easy when you follow the instructions in this section in the order presented. Installing your Tandberg DLT1 internal drive consists of the following steps:

1. Unpack and check your drive for shipping damage.
2. Select a server or workstation that is to be the host for your Tandberg DLT1 internal drive.
3. Set the SCSI ID for your Tandberg DLT1 internal drive.
4. Shut down and turn off the server or workstation that is to be the host for your Tandberg DLT1 internal drive. Remove the power cable from the selected server or workstation. Turn off and remove the power cables from all devices attached to the selected server or workstation.
5. Remove the cover from the selected server or workstation as explained in the server's or workstation's manuals.
6. Install a SCSI host adapter in the server or workstation that is to be the host for your drive, if necessary.
7. Install your Tandberg DLT1 internal drive in a full-height drive bay.
8. Attach the SCSI ribbon cable to your Tandberg DLT1 internal drive and SCSI host adapter.
9. Attach a power cable to your Tandberg DLT1 internal drive.
10. Secure your Tandberg DLT1 internal drive in the selected server or workstation.
11. Check your Tandberg DLT1 internal drive to make sure it is working properly.

Each of these steps is covered in the next few sections.

2.4.2. Unpacking your Drive

Before you begin, you need to clear a desk or table so that you can unpack your Tandberg DLT1 internal drive.

2.4.2.1. Unpacking your Drive

Before you do anything else, unpack and inspect your Tandberg DLT1 internal drive for shipping damage. To do a thorough job, follow these steps:

1. Clear a table or desk so that you have room to unpack your drive.
2. Inspect the shipping box for damage. If you notice any damage, report it to the shipping company immediately.
3. Open the shipping box and remove the SCSI cable and any other accessories.

4. Locate the anti-static wrist strap supplied with your drive.
5. Attach the anti-static strap to your wrist. Clip the other end of the strap to a bare metal surface on a computer's chassis. ***Be careful not to touch any power source with the wrist strap clip.*** Wear the wrist strap during the entire installation process.
6. With the drive still in the shipping box, reach under and around the drive, carefully lift it out of the shipping, and place it on the work surface, top facing up. Do not stand the drive on either end.
7. Carefully remove the drive from the anti-static bag.

2.4.3. Configuration

Configuring your Tandberg DLT1 internal drive is fast and easy. You only need to select a unique SCSI ID and decide if your drive needs to be terminated. The following sections explain how to configure your drive.

2.4.3.1. Setting the SCSI ID

Regardless of the number of SCSI devices attached to the server or workstation that is to be the host for your Tandberg DLT1 internal drive, each must have a unique SCSI ID. Check the SCSI IDs on all other SCSI devices on the selected server or workstation, including the SCSI host adapter, and select an unused SCSI ID for your Tandberg DLT1 internal drive. The factory default SCSI ID is 5. If the factory default SCSI ID is not being used, you do not need to change the drive's SCSI ID.

Locate the SCSI ID jumpers on the rear panel of the drive as shown in Figure 2-5:

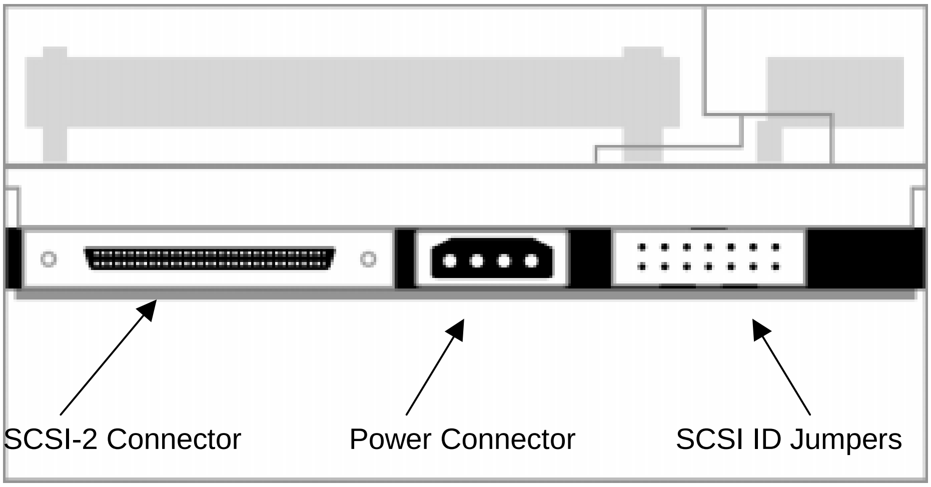
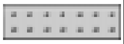
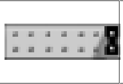
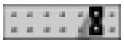
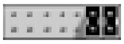
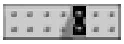
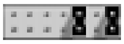
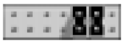
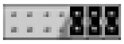
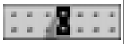
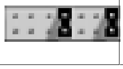
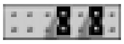
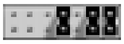
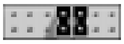
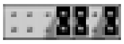
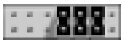
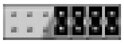


Figure 2-5: SCSI ID Jumper Block Location

To set the SCSI ID on your Tandberg DLT1 internal drive, use the supplied jumpers to select the desired SCSI ID as shown in the following table:

SCSI ID	**0**	**1**	**2**	**3**	**4**	**5***	**6**	**7**
Jumper Block								
SCSI ID	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Jumper Block								

* Factory default SCSI ID

Table 1: Setting the SCSI ID Jumper Block

2.4.3.2. When to Use Termination

If your Tandberg DLT1 internal drive is the only SCSI device – other than the SCSI host adapter – on the selected server or workstation, it must be terminated. Likewise, if your Tandberg DLT1 internal drive is the last SCSI device on the selected server or workstation's SCSI bus, it must be terminated.

To terminate your Tandberg DLT1 internal drive, insert an inline, active LVD/SE terminator into the connector on one end of the supplied SCSI ribbon cable as shown in Figure 2-6. Continue with the rest of the installation as usual.

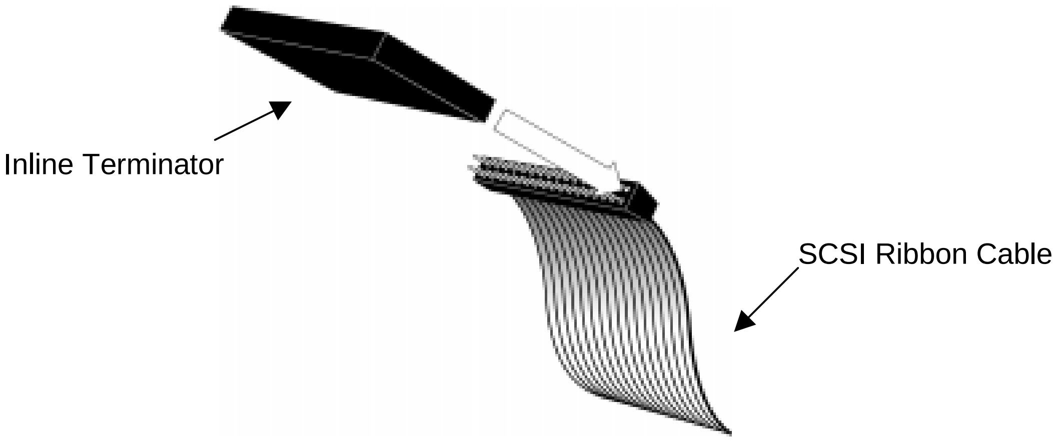


Figure 2-6: Installing the Inline Terminator

NOTE:
If the SCSI cable that came with your SCSI host adapter already has a termintor built into it, do not use an inline terminator. An example of such a cable is shown in Figure 2-7.

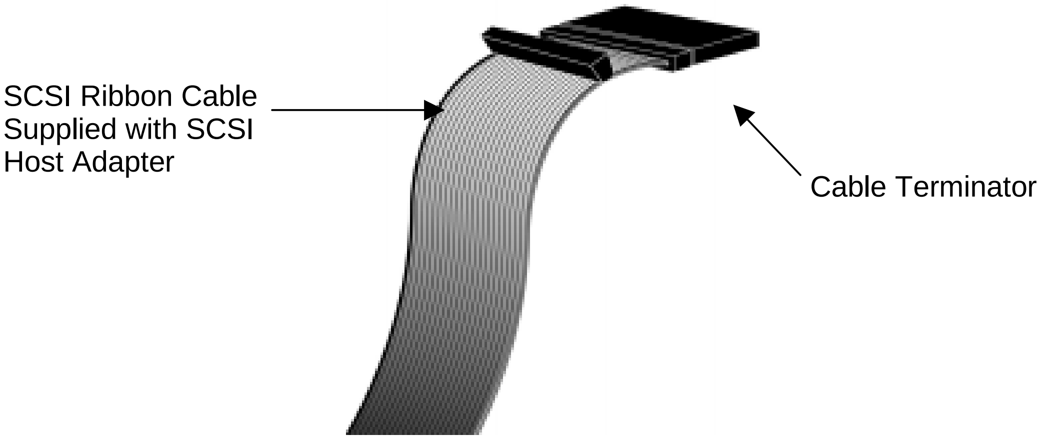


Figure 2-7: SCSI Ribbon Cable with Terminator Built-in

2.4.4. Installing Your Tandberg DLT1 Drive

This is the final installation stage, which requires that you install your Tandberg DLT1 internal drive in the host server or workstation and attach the SCSI and power cables.

To connect the SCSI and power cables to your Tandberg DLT1 internal drive, follow these steps:

1. Shut down the operating system and turn off the selected server or workstation. Turn off all attached accessory devices, such as printers and other SCSI devices. Remove the power cables from the host server or workstation and all attached accessories. Failure to follow these instructions may result in damage to your Tandberg DLT1 internal drive or other devices.

Do not move on to step 2 until you have shut down the operating system and turned off the server or workstation that is to be the host for your Tandberg DLT1 internal drive. Turn off all attached accessory devices, such as printers and other SCSI devices. Remove the power cables from the host server or workstation and all attached accessories.

2. Remove the cover from the host server or workstation as described in the server's or workstation's manuals.

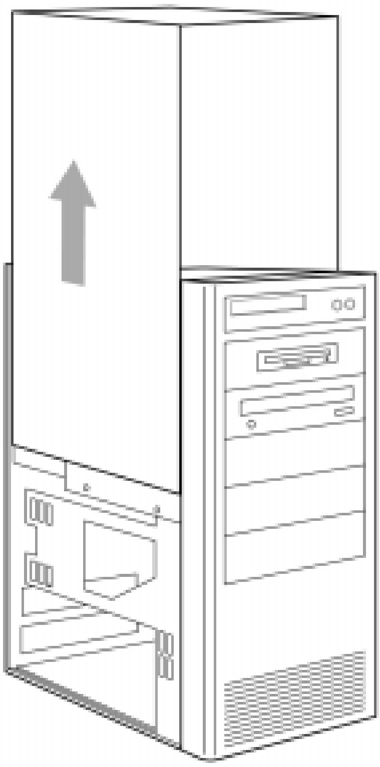


Figure 2-8: Remove Server/Workstation Cover

1. Locate an available full-height, 5¼-inch drive bay and remove the front cover(s) from the drive bay as described in the server's or workstation's manuals.
2. Slide your Tandberg DLT1 internal drive into the open drive bay.

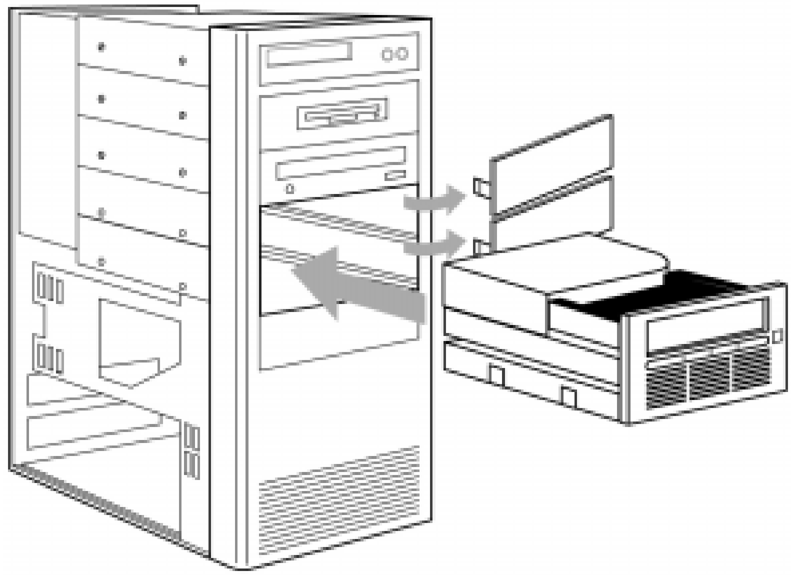


Figure 2-9: Install Drive an an Open Drive Bay

> NOTE***:***
> Install a SCSI host adapter in the selected server or workstation now, if necessary.

> NOTE:
> If your SCSI host adapter already has a ribbon cable with an open 68-pin connector, you can use the existing cable instead of the cable supplied with your Tandberg DLT1 internal drive.

3. Locate the SCSI ribbon cable in the accessories package. Attach one end of the SCSI ribbon cable to the SCSI connector on the rear panel of your Tandberg DLT1 internal drive. The SCSI connectors are keyed, preventing improper connection.

> NOTE:
> Refer to page 2- 10 to determine if you need to use an inline LVD/SE terminator with the SCSI cable.

4. Attach the other end of the SCSI ribbon cable to the SCSI host adapter, aligning the colored stripe on the ribbon cable with pin 1 on the SCSI host adapter's connector.

5. Locate an available power cable in the host server or workstation and attach it to the power connector on the rear panel of your Tandberg DLT1 internal drive. The connectors are keyed, preventing improper connection.

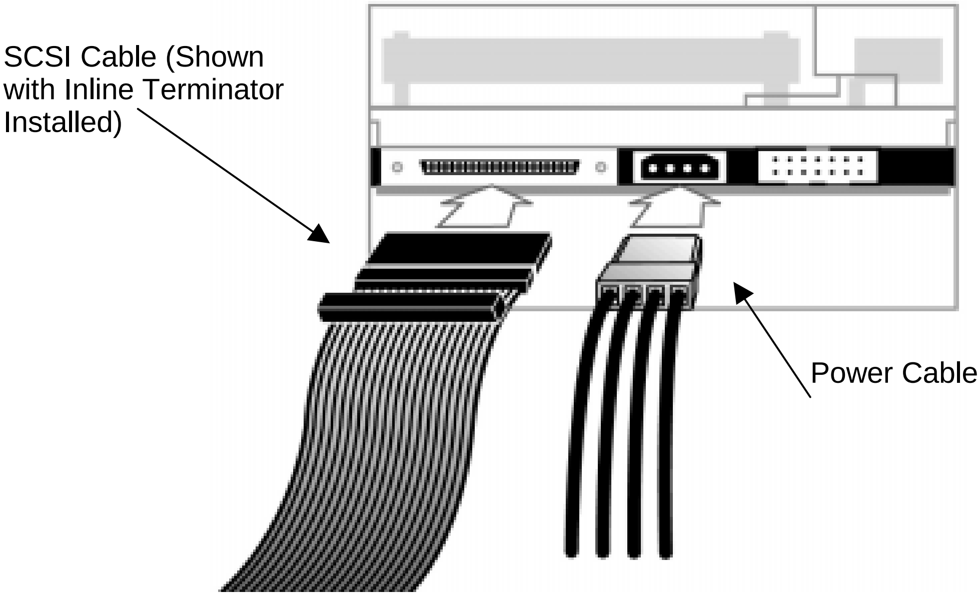


Figure 2-10: Attach SCSI and Power Cables to your Internal Drive

6. Secure your Tandberg DLT1 drive with the appropriate mounting screws, either in the sides or bottom of the drive sled, as appropriate for the server or workstation chassis.

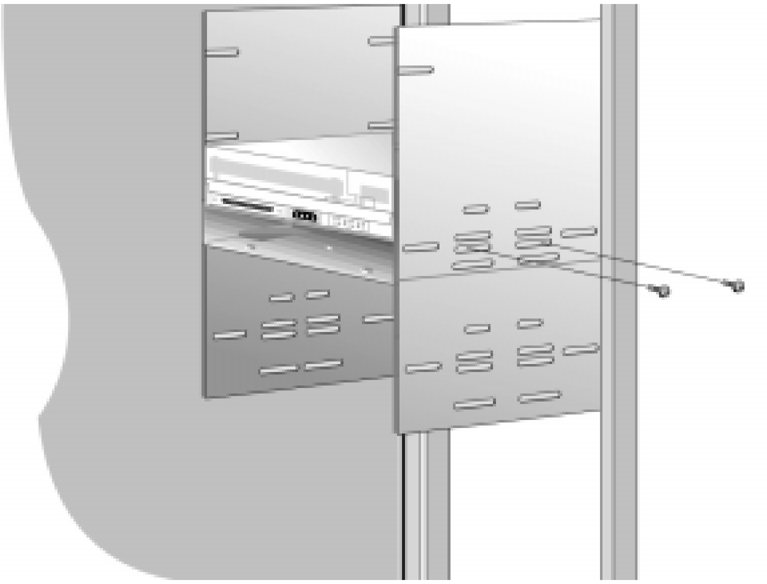


Figure 2-11: Secure Tandberg DLT1 Drive in Installation Bay (Side Mounting Screws Shown)

7. Replace the cover on the server or workstation.
8. Attach the power cables to the server or workstation and all attached accessories.
9. Turn on the host server or workstation and allow its operating system to start.

Refer to the next section to learn about your Tandberg DLT1 internal drive's self-test and initialization features.

2.5. Testing Your Tandberg DLT1 Drive

Every time you turn on your Tandberg DLT1 Drive, it conducts a Power-On Self-Test (POST). This test ensures that your drive is working properly and is ready to use.

While POST is in progress, watch the front panel LEDs to see the progress and results of the test. During POST, the following actions take place:

1. The LEDs turn on all at once and then turn off.
2. If a cartridge is loaded, the In Use LED blinks during initialization.
3. If there is no cartridge loaded, all LEDs turn off after initialization.

POST takes several seconds to complete. The drive is now ready to use. Turn to Chapter 3 for operating instructions.

2.5.1. What to do if POST Fails

If all of the LEDs on the front panel blink continually instead of completing the usual POST sequence, POST has failed. Table 2 helps you troubleshoot POST and other failures:

Symptom	Problem	Solution
None of the drive's LEDs illuminate.	The drive is not receiving power.	Check the drive's power cable. If a desktop drive, check the power cable connections. Plug the power cable into a different power outlet.
All of the LEDs on the front panel blink continually	An internal drive fault has occurred.	1. Press the Eject button to reset the drive. 2. Turn the drive off and then on again. If the drive is a Tandberg DLT1 internal drive, shut down and turn off the host server or workstation, then turn it back on and allow it to boot. 3. Call technical support if POST continues to fail.
The host server or workstation does not recognize your Tandberg DLT1 drive.	The drive's SCSI ID might not be unique.	Change the drive's SCSI ID. Shut down and turn off the host server or workstation; turn off the desktop drive. Change the drive's SCSI ID. Turn on the host server or workstation and desktop drive.
The host server or workstation does not recognize your Tandberg DLT1 drive.	The SCSI host adapter might be incorrectly configured	Check the SCSI host adapter configuration. Refer to the SCSI host adapter manuals for instructions.
	The SCSI cable might be loose.	Check both ends of the SCSI cable, both for the desktop and internal drives.

Symptom	Problem	Solution
	The SCSI terminator might be loose or missing.	1. Make sure the terminator is properly seated on the open SCSI connector on the rear panel of the desktop drive or on the last device on the SCSI bus. 2. Make sure an inline LVD/SE terminator is in place on the SCSI ribbon cable for the internal drive.
	The SCSI bus might be improperly terminated	1. If your Tandberg DLT1 drive is the last or only device on the SCSI bus, make sure the drive is properly terminated. 2. If your Tandberg DLT1 drive is not the last or only device on the SCSI bus, check all SCSI cable connections and make sure the last device on the SCSI bus is terminated.
	The SCSI terminator might not be at the end of the SCSI bus or a more than two terminators might be present on the SCSI bus.	Make sure the terminators are placed only at each end of the SCSI bus – one at the host adapter and one on the last device on the bus.
	The SCSI bus might be too long.	Make sure the total length of the SCSI bus does not exceed the ANSI SCSI standard of 19 feet (6 meters) for a single-ended (SE) bus, 40 feet (12 meters) for an LVD SCSI bus with multiple devices, or 82 feet (25 meters) for an LVD SCSI bus with a single device.
There are fatal or non-fatal errors for which you cannot find the cause.	The SCSI bus might be improperly terminated	1. If your Tandberg DLT1 drive is the last or only device on the SCSI bus, make sure the drive is properly terminated. 2. If your Tandberg DLT1 drive is not the last or only device on the SCSI bus, check all SCSI cable connections and make sure the last device on the SCSI bus is terminated.
	The AC power source may not be properly grounded (Tandberg DLT1 Desktop Drive only).	1. Plug the Tandberg DLT1 Desktop Drive’s power cable into a power outlet on the same circuit as the host server or workstation. 2. Plug the Tandberg DLT1 Desktop Drive’s power cable into a different power outlet.

Table 2: POST Troubleshooting

3. Using Your Tandberg DLT1 Tape Drive

3.1. Chapter Overview

This chapter explains how to use your Tandberg DLT1 tape drive. It describes the front panel LEDs and controls, how to load and eject DLTtape cartridges, how to use and care for DLTtape cartridges, and how to use the cleaning cartridge.

3.2. Front Panel Controls and Indicators

This section explains how to use the front-panel controls and indicators.

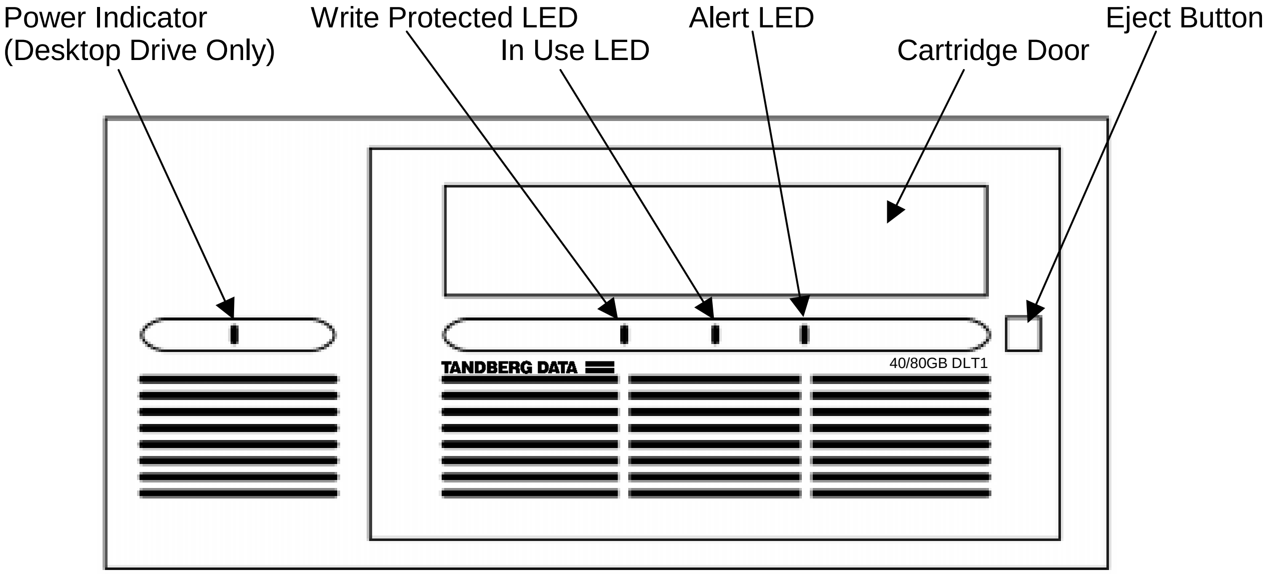


Figure 3-1: Tandberg DLT1 Drive Front Panel

3.2.1. Key to Indicators

This section describes what each front panel indicator means and the circumstances under which one or more indicators are illuminated or blinking.

3.2.1.1. Indicator Activity During Power-On Self-Test (POST)

Every time you turn on your Tandberg DLT1 Drive, it conducts a Power-On Self-Test (POST). This test ensures that your drive is working properly and is ready to use.

While POST is in progress, watch the front panel LEDs to see the progress and results of the test. During POST, the following actions take place:

1. The LEDs turn on all at once and then turn off.
2. If a cartridge is loaded, the In Use LED blinks during initialization.
3. If there is no cartridge loaded, all LEDs turn off after initialization.

POST takes several seconds to complete. The drive is now ready to use.

3.2.1.2. Indicator Activity During Drive Operation

When your Tandberg DLT1 drive is in use, a variety of indicator LEDs can blink or be illuminated. Table 3 describes the circumstances under which one or more indicators are illuminated or blinking immediately after POST. Table 4 describes what each front panel indicator means.

Drive Status	Indicator Activity
No cartridge in drive	The In Use indicator is off.
A cartridge is in the drive	While the drive loads the cartridge, the In Use indicator blinks. When the In Use indicator is steadily illuminated, the drive has loaded the cartridge. The cartridge is ready to use.
The drive detected an error condition	The Write-Protect LED blinks. Eject the cartridge and cycle drive or host power to reinitialize the drive. The drive runs a POST. See section 0 above for POST information.

Table 3: Drive Status and Indicator Activity

Indicator	State	Operating Condition
Write Protected	On	The DLTtape cartridge is write-protected.
	Off	The DLTtape cartridge is write-enabled.
In Use	Blinking	Tape is in motion.
	On	The DLTtape cartridge is loaded and ready to use
	Off	No cartridge is loaded.
Alert	On	The drive read/write heads need to be cleaned or the DLTtape cartridge is bad.
	Remains On after you eject the cleaning tape.	The cleaning tape has expired; no cleaning took place.
	After cleaning, this indicator is illuminated again when you load a DLTtape cartridge.	The DLTtape cartridge is causing problems. Try a different cartridge. If this condition persists with other cartridges, contact Customer Support.
	Off	Cleaning is complete or not needed.
All three LEDs	On	POST is starting.
	Blinking	A POST error has occurred. See Table 2 on page 2- 15 for more information.

Table 4: Indicator Activity

3.3. Using Cartridges

Your Tandberg DLT1 drive uses only DLTtape IV cartridges. Your Tandberg DLT1 drive can read – but not write – DLTtape IV cartridges that use the DLT4000 format.

> NOTE:
> Your Tandberg DLT1 Drive automatically ejects any other cartridge types and any cartridges whose format it cannot read. Make sure all cartridges that you want to use for writing are either unformatted or have been formatted with your Tandberg DLT1 drive before loading them. If you want to reuse cartridges that have been formatted with another manufacturer's drive, use a bulk eraser to prepare the cartridges for use with your Tandberg DLT1 drive.

3.3.1. Loading a Cartridge

To load a cartridge into your Tandberg DLT1 drive:

After the drive completes POST, insert the DLTtape cartridge into the cartridge slot, oriented as shown below, and push the cartridge gently into the drive until it stops.

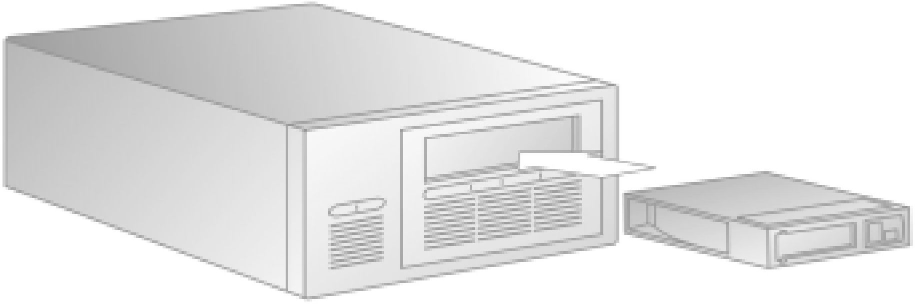


Figure 3-2: Loading a DLTtape Cartridge

The In Use LED blinks while the drive loads the cartridge. When the tape is at BOT, the In Use LED is turns on. The cartridge is now ready to use.

> NOTE***:***
> When you insert a new, unformatted cartridge into your Tandberg DLT1 drive, the loading sequence takes longer because the drive is writing reference tracks on the tape.

3.3.2. Ejecting a Cartridge

CAUTION:
Remove the cartridge from your Tandberg DLT1 drive before turning off the desktop drive or the host server or workstation for an internal drive. Leaving a cartridge in the drive when power is off can result in cartridge and drive damage. When you remove the cartridge from the drive, return the cartridge to its storage case to prolong cartridge life.

To eject a cartridge from your Tandberg DLT1 drive, follow these steps:

1. Press the Eject button or use your backup software to eject the cartridge. The In Use LED blinks while the drive rewinds the tape.
2. When the drive has rewound the tape, it ejects the cartridge.

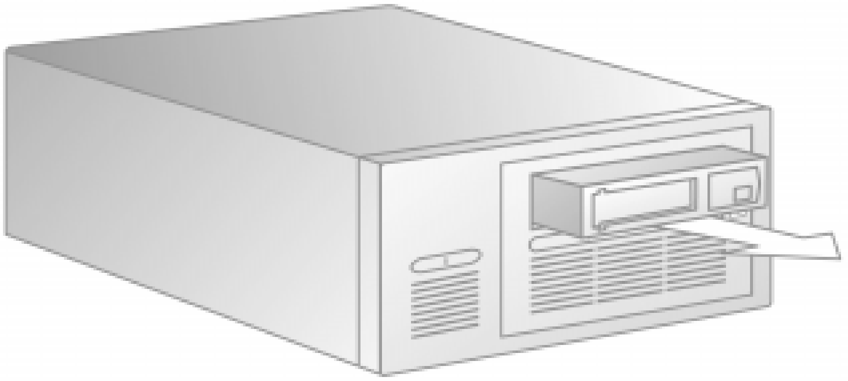


Figure 3-3: Ejecting a DLTtape Cartridge

3. Remove the cartridge from the drive.
4. Return the cartridge to its storage case to prolong cartridge life.

3.3.3. Cartridge Write-Protect Switch

All DLTtape cartridges have a write-protect switch to prevent accidental erasure of data. Before loading a DLTtape cartridge into your Tandberg DLT1 drive, make sure the write-protect switch on the front of the cartridge is positioned as desired.

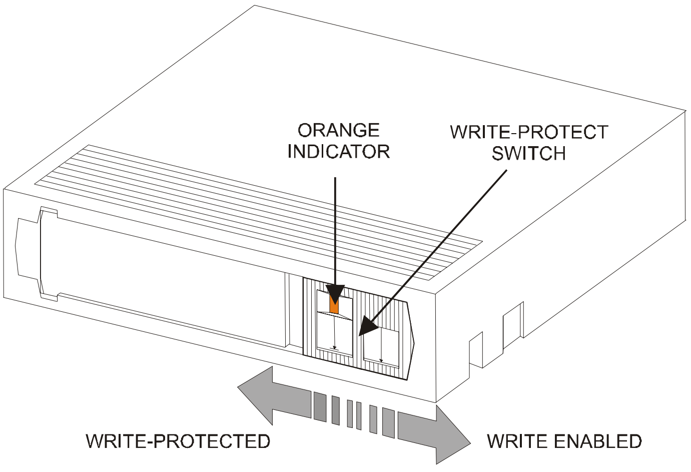


Figure 3-4: DLTtape Cartridge Write-Protect Switch

Slide the switch **to the left** to write-protect the cartridge. A small orange rectangle is visible, indicating that the cartridge is write-protected.

Slide the switch **to the right** to allow your Tandberg DLT1 drive to write data to the cartridge.

3.3.4. Caring for your Cartridges

To ensure the longest possible life for all of your DLTtape cartridges, follow these guidelines:

- Do not drop or strike a cartridge. Excessive shock can displace the tape leader, making the cartridge unusable and possibly damaging your Tandberg DLT1 drive.
- Store your DLTtape cartridges in their storage cases.
- Do not expose your DLTtape cartridges to direct sunlight or sources of heat, including portable heaters and heating ducts.
- Store your DLTtape cartridges in an environment in which temperatures are always between 50° F and 104° F (10° C to 40° C). The ideal storage temperature is 72° F, ± 7° F (22° C ± 4 ° C). Always store your DLTtape cartridges in their storage cases.
- If a DLTtape cartridge has been exposed to temperatures outside the ranges specified above, stabilize the cartridge at room temperature for the same amount of time it was exposed to extreme temperatures, up to 24 hours.
- Store your DLTtape cartridges in a dust-free environment in which relative humidity is always between 20% and 80% (noncondensing). The ideal storage relative humidity is 40%, ± 20%.

- Do not place DLTtape cartridges near sources of electromagnetic energy or strong magnetic fields, such as computer monitors, electric motors, speakers, or X-ray equipment. Exposure to electromagnetic energy or magnetic fields can destroy data on cartridges.
- Place identification labels only in the slide-in slot on the front of the cartridge.
- Never use any type of adhesive labels on your DLTtape cartridges.

3.3.5. Using the Cleaning Cartridge

When the Alert LED is on, your Tandberg DLT1 drive's read/write head needs to be cleaned.

Follow the instructions on page 3-3 to load the cleaning cartridge.

Use only Tandberg Data-approved cleaning cartridges in your Tandberg DLT1 drive. Use of any other type of cleaning cartridge can damage the read/write head in your drive. If you load any other type of cleaning cartridge or method, your Tandberg DLT1 drive ejects it immediately.

When the cleaning cartridge has cleaned the read/write head, the Alert LED turns off to indicate that you should remove the cleaning cartridge.

NOTE:
If the Alert LED does not turn off when you load the cleaning cartridge, the cleaning cartridge has expired and must be replaced. Each clearning cartridge has a useful life of 20 cleaning operations.

Follow the instructions on page 3- 4 to eject the cleaning cartridge.

NOTE:
If any LEDs blink or if the Alert LED is illuminated again immediately after cleaning, see Table 4 on page 3- 2 for more information.

4. Installing and Using Your Tandberg DLT7 Autoloader

4.1. Chapter Overview

This chapter explains how to install and use your Tandberg DLT7 Autoloader. Your Tandberg DLT7 Autoloader is a fully automated, high-performance, high-capacity, mass storage device. It is designed to provide you with unattended, near-line and off-line data storage, archiving, backup, hierarchical storage management (HSM), and retrieval for low- and mid-range servers and networks.

4.1.1. Product Introduction

This section describes of the connectors, controls, and indicators on the front and rear panels of your Tandberg DLT7 Autoloader, describes other requirements (additional hardware and/or software), needed to use your Tandberg DLT7 Autoloader, and provides a brief overview of the your autoloader's features.

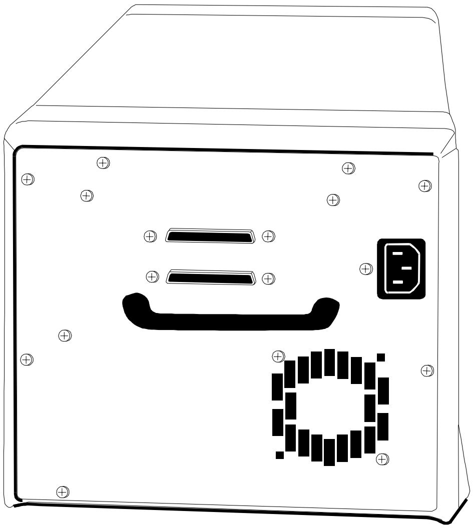
Your Tandberg DLT1 Autoloader is a SCSI-2 compatible data storage device that incorporates a Tandberg DLT1 drive featuring high capacity, high throughput, and data compression. Your Tandberg DLT7 Autoloader operates as two SCSI devices on a single SCSI bus, one device for the Tandberg DLT1 drive, the other for the autoloader robotics. Your Tandberg DLT7 Autoloader can contain up to seven DLTtape IV data cartridges providing a maximum formatted capacity of 560 Gigabytes and a sustained data transfer rate as high as 360MB per minute.

Your Tandberg DLT7 Autoloader is compatible with all operating systems and environments supporting the SCSI interface, but requires either direct support of the operating system or a suitable backup application to take advantage of its features. Hosting environments that do not directly support SCSI interfaces, like most personal computers, require a SCSI host adapter card.

Your Tandberg DLT7 Autoloader can operate in either Random-Access or Sequential-Access modes. In Random-Access mode, your backup application controls cartridge management. In Sequential-Mode, the Tandberg DLT7 Autoloader firmware predefines cartridge management.

4.1.1.1. Rear Panel Connectors

The rear panel of your Tandberg DLT7 Autoloader contains the SCSI interface and power connectors.



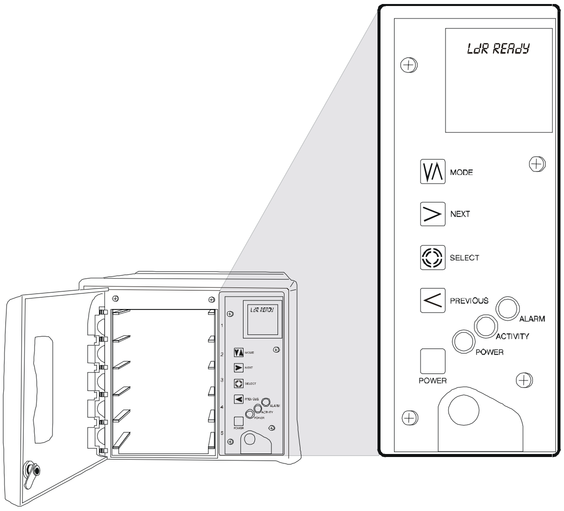
Rear Panel

Connectors	
AC Power Connector	Connector for AC power cord.
SCSI Channel Connectors	Connectors for the SCSI interface cable that connects the autoloader to the host server or workstation and/or to other devices on the SCSI bus. The interface cable can be attached to either connector. If your Tandberg DLT7 Autoloader is the last device on the SCSI bus, attach the supplied terminator to the open SCSI connector.

Table 5: Tandberg DLT7 Autoloader Rear Panel Connectors

4.1.1.2. Front Panel Controls, Indicators

The front panel controls and indicators are located on the Operator's Panel, which is located behind the front door of the DLT Autoloader. If necessary, unlock the door to access the Operator's Panel. When you first unpack your Tandberg DLT7 Autoloader, the front door keys are taped to the rear panel.

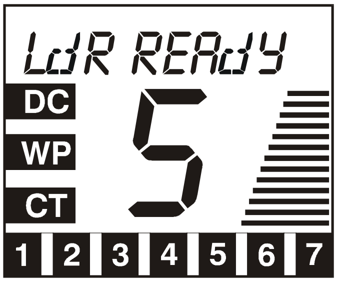


Operator's Panel

Indicators	
Power LED (green)	Illuminated when power is on.
Activity LED (blinking amber)	Indicates robotic and drive activity. Slow blink indicates autoloader robotic activity. Fast blink indicates drive activity.
Alarm LED (red)	Illuminated whenever an error has occurred.
LCD	1-line x 10-character Liquid Crystal Display (LCD). Displays information about drive status and operational and error messages.

Table 6: Tandberg DLT7 Autoloader Front Panel Controls and Indicators

The LCD panel displays the information indicated in the following table:

<table>
<tr><th colspan="2">Indicators</th></tr>
<tr><td colspan="2">The normal on-line message (LdR REAdY) is displayed on the top line. On-line, off-line, and error messages also appear on this line.</td></tr>
<tr><td>


LCD
</td><td>

DC indicates that data compression is selected on the drive.

WP indicates that a write-protected data cartridge is loaded into the drive.

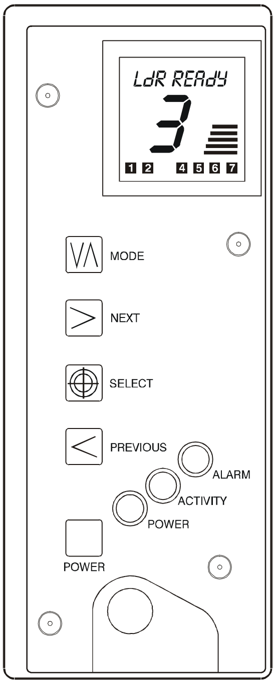
CT indicates that the drive read/write head needs to be cleaned.

The large field in the center of the display normally indicates which cartridge is loaded into the drive. Whenever an error occurs an **E** appears in this field and the error message appears on line 1.

The Activity Bars on the right side of the display, with the Activity LED, indicate robotic and drive activity. A blinking bottom bar is displayed when no activity is taking place. A slow interval between the bars appearing and disappearing indicates robotic activity. A fast interval indicates drive activity.
</td></tr>
<tr><td colspan="2">The seven numeric fields at the bottom of the display indicate which slots currently have cartridges loaded</td></tr>
</table>

Table 7: LCD Panel Indicators

The Operator's Panel contains the controls and indicators indicated in the following table:

<table>
<tr><td rowspan="6">


Operator's Panel
</td><th colspan="2">Controls</th></tr>
<tr><td>MODE</td><td>Press this button to enter or exit off-line mode menus.</td></tr>
<tr><td>NEXT</td><td>Selects next item or value in the currently displayed menu.</td></tr>
<tr><td>SELECT</td><td>Executes the current menu or command displayed on line 1 of the LCD panel.</td></tr>
<tr><td>PREVIOUS</td><td>Selects previous item or value in the currently displayed menu.</td></tr>
<tr><td>POWER</td><td>Press and release this button to turn on your Tandberg DLT7 Autoloader.
Press and hold this button for 2 seconds to turn off your Tandberg DLT7 Autoloader. POWER dOWN appears on the LCD panel and the Activity Bars and Activity LED indicate robotic activity as the Picker moves to its power down position.</td></tr>
</table>

Table 8: Operator's Panel Controls and Indicators

4.2. Installing Your Tandberg DLT7 Autoloader

This section contains step-by-step instructions for installing your Tandberg DLT7 Autoloader. Before you begin installing your Tandberg DLT7 Autoloader, make sure the host server or workstation contains a SCSI-2 host adapter.

4.2.1. Installation Overview

Installing your Tandberg DLT7 Autoloader is fast and easy when you follow the instructions in this section in the order presented. Installing your Tandberg DLT7 Autoloader consists of the following steps:

1. Unpack and check your autoloader for shipping damage.
2. Select a location near the server or workstation that is to be the host for your Tandberg DLT7 Autoloader.
3. Shut down and turn off the server or workstation that is to be the host for your Tandberg DLT7 Autoloader. Remove power from the selected server or workstation. Turn off and remove power from all devices attached to the selected server or workstation.
4. Attach the SCSI cable to your Tandberg DLT7 Autoloader and SCSI host adapter. Make sure a SCSI host adapter is installed in the server or workstation that is to be the host for your drive.
5. Attach the power cable to your Tandberg DLT7 Autoloader and plug in the power cable to the nearest power outlet.
6. Check your Tandberg DLT7 Autoloader to make sure it is working properly.
7. Set the SCSI IDs for your Tandberg DLT7 Autoloader and drive.

Each of these steps is covered in the next few sections.

4.2.2. Unpacking Your Tandberg DLT7 Autoloader and Selecting a Location

Before you begin, you need to clear a desk or table so that you can unpack your Tandberg DLT7 Autoloader. You also need to select a location near the server or workstation that is to be the host for your autoloader.

4.2.2.1. Unpacking your Autoloader

NOTE:
If room in which you are working differs from the temperature in which your Tandberg DLT7 Autoloader was shipped or stored by 15° C (30° F) or more, let your autoloader acclimate to the surrounding environment for at least 12 hours before opening the shipping carton.

Before you do anything else, unpack and inspect your Tandberg DLT7 Autoloader for shipping damage. To do a thorough job, follow these steps:

1. Clear a table or desk so that you have room to unpack your autoloader.
2. Inspect the shipping box for damage. If you notice any damage, report it to the shipping company immediately.
3. Open the shipping box and remove the accessories package. Set the accessories package aside for now.
4. With the autoloader still in the shipping box, turn the autoloader and padding on its side, then lift the autoloader and padding out of the box and place it on the work surface, top facing up. Do not stand the autoloader on either end.
5. Carefully remove the shipping padding from the front and back of the autoloader. Then remove the anti-static bag from the autoloader.
6. Open the accessories package so that the accessories are handy during installation.

NOTE:
Save the packing materials in case you need to move or ship the system in the future. You must ship your Tandberg DLT7 Autoloader in the original or equivalent packing materials or your warranty may be invalidated.

4.2.2.2. Selecting a Location for your Autoloader

Select a location for your Tandberg DLT7 Autoloader that is flat, sturdy, level, and close to the host server or workstation. A desk or table top is most suitable. Regardless of the location you choose for your Tandberg DLT7 Autoloader, make sure the environment is free from dust and excessive humidity. See the *Tandberg DLT1 Reference Manual* for acceptable operating humidity limits.

Be sure to follow these additional guidelines when selecting a location for your Tandberg DLT7 Autoloader:

- Allow at least 6 inches (15.2 cm) behind the autoloader for proper cooling.
- Avoid locations near printers or photo copy machines, both of which produce paper fiber and other types of dust and airborne contaminants.
- Do not place your autoloader on the floor.
- Place your autoloader on a hard, level surface. Do not place your autoloader on a carpeted surface.
- Avoid locations near generators, electric motors, audio speakers, or other sources of magnetic fields. Magnetic fields can adversely affect your autoloader and media.

4.2.2.3. SCSI Requirements

Your Tandberg DLT7 Autoloader requires a wide, SCSI-2, Low-Voltage Differential (LVD) SCSI bus. Make sure your SCSI host adapter or controller supports these standards.

4.2.3. Configuration

Configuring your Tandberg DLT7 Autoloader is fast and easy. You only need to decide if your autoloader needs to be terminated. The following section explain how to configure your drive.

4.2.3.1. When to Use Termination

If your Tandberg DLT7 Autoloader is the only SCSI device – other than the SCSI host adapter – on the selected server or workstation, it must be terminated. Likewise, if your Tandberg DLT7 Autoloader is the last SCSI device on the SCSI bus on the selected server or workstation, it must be terminated.

To terminate your Tandberg DLT7 Autoloader, locate the terminator in the accessories package and press it firmly into either of the two SCSI connectors on the rear panel of the autoloader. Secure the terminator by tightening the finger-screws until snug or by snapping the wire bales into place.

4.2.4. Connecting the SCSI Cable(s)

This is the final installation stage, which requires only that you attach the SCSI and power cables to your Tandberg DLT7 Autoloader.

To connect the SCSI and power cables to your Tandberg DLT7 Autoloader, follow these steps:

1. Before you continue, shut down the operating system and turn off the selected server or workstation. Turn off all attached accessory devices, such as printers and other SCSI devices. Unplug the host server or workstation and all attached accessories. Failure to follow these instructions may result in damage to your Tandberg DLT7 Autoloader or other devices.

> ***Do not move on to step 2*** until you have shut down the operating system and turned off the server or workstation that is to be the host for your Tandberg DLT7 Autoloader. Turn off all attached accessory devices, such as printers and other SCSI devices. Unplug the host server or workstation and all attached accessories.

2. Locate the SCSI cable in the accessories package.
3. Attach one end of the SCSI cable to one of the connectors on the rear panel of your Tandberg DLT7 Autoloader.
4. Attach the other end of the SCSI cable to the connector on your SCSI host adapter or to the connector on the previous SCSI device in the SCSI bus.

5. Secure the SCSI cable connectors by tightening the finger-screws until snug or by snapping the wire bales into place.

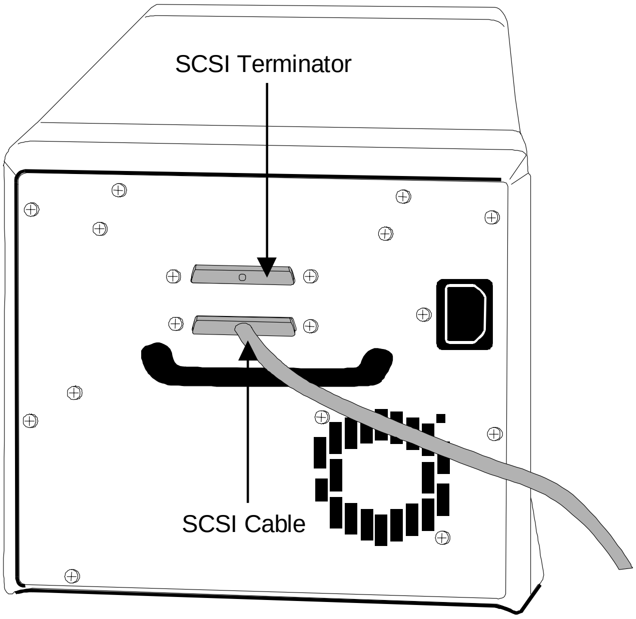


Figure 4-1: Attach SCSI and Power Cable to your Autoloader

4.2.5. Turning on Your Tandberg DLT7 Autoloader for the First Time

1. Remove the front door keys, which are taped to the rear panel. Then unlock and open the front door.
2. Remove the foam shipping block from the cartridge storage area.
3. Attach the female connector on the power cable to the power connector on the rear panel of the autoloader.
4. Plug in the power cable to the nearest grounded power outlet.

Use caution when plugging the power cord into an electrical outlet. Hazardous voltages are present in the sockets of the outlet.

5. Plug in the host server or workstation and all attached devices.
6. Turn on your Tandberg DLT7 Autoloader. Check the LCD panel to make sure the autoloader is receiving power. If it is not, check the power connections and your power source.
7. Turn on the host server or workstation and allow its operating system to start. If you have not already installed your backup application, do so now.

While your Tandberg DLT7 Autoloader initializes, **LdR INIT** and the Activity Bars appear on the LCD panel and the Activity LED blinks slowly.

After your Tandberg DLT7 Autoloader completes its initialization sequence, it then initializes the drive. While the drive is initializing, **dRV INIT** and the Activity Bars appear on the LCD panel and the Activity LED blinks quickly.

When the entire initialization sequence is complete, **LdR REAdY** appears on the LCD panel.

Your Tandberg DLT7 Autoloader is now ready to use.

4.2.6. Setting the SCSI IDs

Your Tandberg DLT7 Autoloader uses two SCSI IDs: one for the drive and one for the autoloader robotics. Depending on your host server's or workstation's requirements, you may need to change the SCSI ID of either or both of your Tandberg DLT7 Autoloader devices before you can use your autoloader. Be sure to select SCSI IDs that no other device on the SCSI bus is currently using.

NOTE*:*
The default SCSI IDs for your Tandberg DLT7 Autoloader are:
- Autoloader robotics: **SCSI ID 1**
- Drive: **SCSI ID 3**

To change the SCSI ID for either or both the Autoloader robotics or drive, follow these steps:

1. Press the **Mode** button on the operator's panel repeatedly until **Set SCSI (Mode 6)** appears on the first line of the LCD panel.
2. Press the **Select** button to enter SCSI ID setting mode. **LdR SCSI** appears on the LCD panel.
3. Press the **Select** button to select the SCSI ID for the autoloader robotics. **LdR Id x** – where **x** indicates the current SCSI ID of the autoloader robotics – appears on the LCD panel.
4. Press the **Next** button to select the next higher SCSI ID. Press the **Previous** button to select the next lower SCSI ID. Repeat this process until the desired SCSI ID appears on the LCD panel.
5. Press the **Select** button to set the new SCSI ID for the autoloader robotics.

dRV Id x – where **x** indicates the current SCSI ID of the autoloader robotics – appears on the LCD panel.

6. Press the **Next** button to select the next higher SCSI ID. Press the **Previous** button to select the next lower SCSI ID. Repeat this process until the desired SCSI ID appears on the LCD panel.
7. Press the **Select** button to set the new SCSI ID for the drive.

CYCLE PWR (blinking) appears on the LCD panel for approximately 10 seconds.

8. Press and hold the **Power** button for approximately two seconds to turn off your Tandberg DLT7 Autoloader.
9. Wait a few seconds, then press the Power button again to turn on your Tandberg DLT7 Autoloader.

The selected SCSI IDs are now in effect.

NOTE:
You may also need to cycle power on the host server or workstation and reconfigure your backup software before you can use your Tandberg DLT7 Autoloader.

4.3. Using Your Tandberg DLT7 Autoloader

4.3.1. General Use Guidelines

After you have installed your Tandberg DLT7 Autoloader and backup software, all you need to do is load the DLTtape IV cartridges you plan to use. You can then use your backup application to back up and restore data. The only reason you should need to open your Tandberg DLT7 Autoloader is to replace data cartridges.

Before you use your Tandberg DLT7 Autoloader, make sure you observe these general rules:

- Do not open the front door of your Tandberg DLT7 Autoloader unless you need perform manual mode commands or replace cartridges.
- Use only DLTtape IV cartridges. Your Tandberg DLT1 drive can read – but not write – DLTtape IV cartridges that use the DLT4000 format. Make sure all cartridges that you want to use for writing are either unformatted or have been formatted with your Tandberg DLT1 drive before loading them. If you want to reuse cartridges that have been formatted with another manufacturer’s drive, use a bulk eraser to prepare the cartridges for use with your Tandberg DLT7 Autoloader.
- Clean your Tandberg DLT1 drive as soon as possible whenever **CT** appears on the LCD panel. Be sure to use only Tandberg Data approved cleaning cartridges. Use of any other type of cleaning cartridge can damage the read/write head in your Tandberg DLT1 drive.
- ***Never insert or remove cartridges*** from the storage slots unless **LdR READY** is displayed on the LCD panel.

4.3.2. Turning Your Tandberg DLT7 Autoloader On and Off

Your Tandberg DLT7 Autoloader has a key-lock on the front door to prevent unauthorized access or tampering. The keys are taped to the rear panel of your Tandberg DLT7 Autoloader. Remove the keys and open the front door.

NOTE:
Be sure to store the keys to your Tandberg DLT7 Autoloader in a safe place.

4.3.2.1. Turning On Your Tandberg DLT7 Autoloader

Press the **Power** button on the Operator Panel inside the front door.

While your Tandberg DLT7 Autoloader initializes, **LdR INIT** and the Activity Bars appear on the LCD panel and the Activity LED blinks slowly.

After your Tandberg DLT7 Autoloader completes its initialization sequence, it then initializes the drive. While the drive is initializing, **dRV INIT** and the Activity Bars appear on the LCD panel and the Activity LED blinks quickly.

When the entire initialization sequence is complete, **LdR REAdY** appears on the LCD panel.

Your Tandberg DLT7 Autoloader is now ready to use.

4.3.2.2. Power-On Checks

When you turn on your Tandberg DLT7 Autoloader, it performs these actions:

- Verifies drive configuration and status
- Builds a valid cartridge inventory log
- Calibrates the Media Transporter.

When your Tandberg DLT7 Autoloader completes these power-on checks, it automatically puts itself in Ready Mode.

4.3.2.3. Turning Off Your Tandberg DLT7 Autoloader

Before you turn off your Tandberg DLT7 Autoloader, wait until all tape operations have completed. Then, press and hold the **Power** button on the Operator Panel for two seconds.

4.3.3. Preparing and Installing DLTtape Cartridges

Installing DLTtape cartridges into your Tandberg DLT7 Autoloader is fast and easy. Just follow the instructions in this section.

1. Before you do anything else, gather the DLTtape cartridges you want to use with your Tandberg DLT7 Autoloader.
2. Make sure the write-protect switch is set as desired for each cartridge. Refer to page 3- 4 for instructions on setting the write-protect switch.
3. Put the cartridges in the order you want to use them, if desired.
4. Turn on your Tandberg DLT7 Autoloader and wait until it has completed its initialization sequence. Unlock and open the front door. The LCD panel must display **LdR REAdY** before you continue.
5. If you have a definite order of use in mind for your DLTtape cartridges, insert cartridges 6 and 7 into slots 1 and 2 respectively. Verify that the LCD panel shows that slots 1 and 2 have cartridges installed.

6. Press the **Mode** button repeatedly until **LOAd SLOT** appears on the LCD panel. This command always moves the cartridges in slots 1 and 2 to slots 6 and 7 respectively.
7. Press the **Select** button to select the **LOAd SLOT** command. **SRC SLOT 1** now appears on the LCD panel.
8. Press the **Select** button again to move the cartridge from slot 1 to slot 6.

While your Tandberg DLT7 Autoloader moves the cartridge to slot 6, several messages appear on the LCD panel. When the cartridge is in slot 6, **LdR REAdY** appears on the LCD panel.

9. Verify that the LCD panel shows that slots 2 and 6 have cartridges installed. Then, press the **Mode** button repeatedly until **LOAd SLOT** appears on the LCD panel.
10. Press the **Select** button to select the **LOAd SLOT** command. **SRC SLOT 2** now appears on the LCD panel.
11. Press the **Select** button again to move the cartridge from slot 2 to slot 7.

While your Tandberg DLT7 Autoloader moves the cartridge to slot 7, several messages appear on the LCD panel. When the cartridge is in slot 7, **LdR REAdY** appears on the LCD panel.

12. Verify that the LCD panel shows that slots 6 and 7 have cartridges installed. Then, insert the remaining cartridges into slots 1 through 5.
13. Verify that the LCD panel shows that slots 1 through 7 have cartridges installed.
14. Close and lock the front door on your Tandberg DLT7 Autoloader.
15. Turn on the host server or workstation and allow its operating system to start.
16. Start your backup application.

The backup application now controls your Tandberg DLT7 Autoloader. You can still access manual commands using the Mode button as described in the next section.

4.3.4. Drive Status Messages

During on-line operation, your Tandberg DLT7 Autoloader displays drive status messages on the top line of the LCD panel. The following table lists the messages that appear on the LCD panel and explains their meanings:

Drive Status Message	Description
CALIBRATE	Drive is calibrating head to tracks on tape
EJECTING	Drive is ejecting tape
LOAdING	Drive is loading tape
CLEANING	Drive is cleaning head with cleaning cartridge
ERASING	Drive is erasing tape
REAdING	Drive is reading tape
WRITING	Drive is writing to tape
SEEKING	Drive is seeking to position on tape
REWINdING	Drive is rewinding tape

Table 9: Drive Status Messages

4.4. Tandberg DLT7 Autoloader Manual Control Modes

This section describes the manual control modes your Tandberg DLT7 Autoloader implements. These modes are available by using the buttons on the Operator Panel. Normally, your backup application performs all of the tasks available through manual control modes, but there may be occasions when you want to access these functions directly.

To access any of the Modes, press the **MODE** button repeatedly until the LCD panel displays the desired mode on line 1.

To exit any of the Modes and return to **LdR REAdY**, press the **MODE** button.

4.4.1. Mode 1A – LOAD DRV

This Mode loads a cartridge into the drive. To access **Mode 1A**:

1. Press the **MODE** button repeatedly until **LOAd dRV** appears on the LCD panel.

NOTE:
If a cartridge is already loaded in the drive, you can only access **Mode 1B, EJECT DRV.**

2. Press the **SELECT** button. **SRC SLOT** appears on the LCD panel. If the source slot is empty, **RESELECT** blinks on the LCD panel.
3. Press the **NEXT** or **PREVIOUS** button to scroll through the slot choices. Press **SELECT** when the slot you want to load is displayed.

Your Tandberg DLT7 Autoloader loads the selected cartridge into the drive and displays **LdR REAdY** and the slot number of the tape in the drive on the LCD panel.

4.4.2. Mode 1B – EJECT DRV

This Mode ejects the cartridge from the drive and places it into the storage slot from which it was originally loaded. To access **Mode 1B**:

1. Press the **MODE** button repeatedly until **EJECT dRV** appears on the LCD panel.

NOTE:
If the drive is empty, you can only access **Mode 1A LOAD DRV.**

2. Press the **SELECT** button. **EJECTING** appears on the LCD panel while the drive ejects the cartridge.

Your Tandberg DLT7 Autoloader moves the cartridge back to its storage slot and displays **LdR REAdY.**

4.4.3. Mode 2 – LOAD SLOT

This Mode loads slot 6 from slot 1, or slot 7 from slot 2. This is the only way to load cartridges into slots 6 and 7. Place a cartridge in slot 1 if loading slot 6, slot 2 if loading slot 7, or both if loading slots 6 and 7. To access **Mode 2**:

1. Press the **MODE** button repeatedly until **LOAd SLOT** appears on the LCD panel.

NOTE:
If both slots 6 and 7 already contain cartridges, you cannot select **Mode 2**.

2. Press the **SELECT** button. **SRC SLOT n** (where **n** is either **6** or **7**) appears on the LCD panel.
3. Press the **SELECT** button to move the cartridge from **SRC SLOT n** to its corresponding destination: slot 1 to slot 6, or from slot 2 to slot 7.

Your Tandberg DLT7 Autoloader moves the cartridge and displays **LdR REAdY.**

4.4.4. Mode 3 – EJECT SLOT

This Mode moves a cartridge from slot 6 to slot 1, or from slot 7 to slot 2. This is the only way to remove cartridges from slots 6 and 7. Make sure slots 1 and/or 2 are empty before using this Mode. To access **Mode 3**:

1. Press the **MODE** button repeatedly until **EJECT SLOT** appears on the LCD panel.
2. Press the **SELECT** button. **SRC SLOT n** (where **n** is either **6** or **7**) appears on the LCD panel. If the source slot is empty or the destination slot is full, **RESELECT** blinks on the LCD panel. Select a different **SRC SLOT** to continue with this MODE.
3. Press the **NEXT** or **PREVIOUS** button to select slot 6 or 7.
4. Press **SELECT** when the desired slot is displayed.

Your Tandberg DLT7 Autoloader moves the cartridge and displays **LdR REAdY.**

4.4.5. Mode 4 – EJECT PCKR

This Mode moves a cartridge left in the Media Picker at power down to any empty destination slot. A cartridge normally should **not** be left in the Picker at power down.

> NOTE:
> If you attempt to use EJECT PCKR Mode when the Media Picker is empty, **PCKR EMPTY** and a large **E** – indicating an error condition – appear on the LCD panel for approximately 25 seconds. If this occurs, press the **Mode** button to return to **LdR REAdY** before the 25 seconds elapses.

To access **Mode 4**:

1. Press the **MODE** button repeatedly until **EJECT PCKR** appears on the LCD panel.
2. Press the **SELECT** button to select **Mode 4**. **dST SLOT n** (where **n** is the slot to which your Tandberg DLT7 Autoloader will move the cartridge) appears on the LCD panel while the drive ejects the cartridge.
3. Press the **NEXT** or **PREVIOUS** button to scroll through the destination slot choices. Press **SELECT** when the desired destination slot is displayed. If the destination slot already contains a cartridge, **RESELECT** blinks on the LCD panel. Select a different destination slot.

Your Tandberg DLT7 Autoloader moves the cartridge and displays **LdR REAdY.**

4.4.6. Mode 5 – DENSITY

Cartridge density is fixed and cannot be changed. This mode is not valid.

4.4.7. Mode 6 – SET SCSI

This Mode sets the SCSI ID of the robotics and/or the drive.

> NOTE:
> SCSI ID changes are not effective until you cyclepower on your Tandberg DLT7 Autoloader.

To access **Mode 6**:

1. Press the **Mode** button on the operator's panel repeatedly until **Set SCSI (Mode 6)** appears on the first line of the LCD panel.
2. Press the **Select** button to enter SCSI ID setting mode. **LdR SCSI** appears on the LCD panel.
3. Press the **Select** button to select the SCSI ID for the autoloader robotics. **LdR Id x** – where **x** indicates the current SCSI ID of the autoloader robotics – appears on the LCD panel.
4. Press the **Next** button to select the next higher SCSI ID. Press the **Previous** button to select the next lower SCSI ID. Repeat this process until the desired SCSI ID appears on the LCD panel.
5. Press the **Select** button to set the new SCSI ID for the autoloader robotics.

dRV Id x – where **x** indicates the current SCSI ID of the autoloader robotics – appears on the LCD panel.

6. Press the **Next** button to select the next higher SCSI ID. Press the **Previous** button to select the next lower SCSI ID. Repeat this process until the desired SCSI ID appears on the LCD panel.
7. Press the **Select** button to set the new SCSI ID for the drive.

CYCLE PWR (blinking) appears on the LCD panel for approximately 10 seconds.

8. Press and hold the **Power** button for approximately two seconds to turn off your Tandberg DLT7 Autoloader.
9. Wait a few seconds, then press the Power button again to turn on your Tandberg DLT7 Autoloader.

The selected SCSI IDs are now in effect.

NOTE:
You may also need to cycle power on the host server or workstation and reconfigure your backup software before you can use your Tandberg DLT7 Autoloader.

4.5. Routine Maintenance

This section contains instructions for routine maintenance of your Tandberg DLT7 Autoloader and Tandberg DLT1 drive.

4.5.1. Cleaning the Drive Read/Write Head

Keeping your Tandberg DLT1 drive clean is the single most important requirement for achieving and maintaining superior performance. Cleaning the read/write head should always be performed as soon as possible after **CT** appears on the LCD panel.

Some backup applications include an auto-clean feature. If your backup application supports an auto-clean cycle, we strongly recommended that you use it.

If your backup application does not have an auto-clean feature, you can use your Tandberg DLT7 Autoloader's built-in **AUTOCLEAN** feature. Using this feature, however, reduces the cartridge capacity of the autoloader to 6 tapes whenever **AUTOCLEAN** is enabled.

4.5.1.1. Cleaning Cartridge

NOTE:
Use only a Tandberg Data-approved cleaning cartridge to clean the drive read/write head. Use of any other type of cleaning cartridge or cleaning method can damage your drive's read/write head.

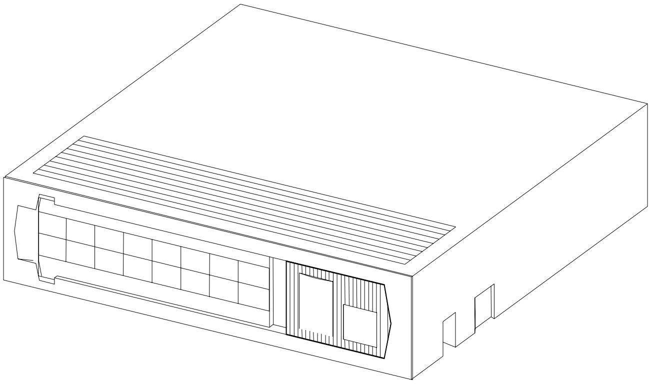


Figure 4-2: DLT Cleaning Cartridge

Each cleaning cartridge has a useful life of 20 cleanings. The cleaning cartridge includes a label with 20 small boxes printed on it. Always place a check mark in a box each time you use the cartridge to clean the drive. Replace the cleaning cartridge when all boxes are checked.

The following table tells you when to use the cleaning cartridge:

LCD Panel Display	Meaning	Action
CT appears on the LCD panel	The drive's read/write head need to be-cleaned or the cartridge is bad	Use the cleaning tape to clean the drive head. When cleaning is complete, check off a cleaning on the cleaning cartridge label.
A particular cartridge causes the **CT** field to appear on the LCD panel	The cartridge may be damaged	Back up the data from this cartridge onto another cartridge. A damaged cartridge may cause unnecessary use of the cleaning cartridge.
The **CT** field re-appears after cleaning and reloading a data cartridge	1. Cleaning was not accomplished because you have used the cleaning cartridge 20 times	Replace the cleaning cartridge.
	2. The data cartridge may be damaged	Back up the data from this cartridge onto another cartridge, it may be damaged. A damaged cartridge may cause unnecessary use of the cleaning cartridge.

Table 10: Cleaning Cartridge Information

4.5.1.2. Automatic Read/Write Head Cleaning

NOTE:
Use this procedure only if your backup application does not include an auto-clean feature.

Your Tandberg DLT7 Autoloader's AUTOCLEAN feature is available on the Diagnostic Menu. To access the Diagnostic Menu, press and hold the **NEXT** button and then press and hold the **MODE** button for approximately 5 seconds. **dIAG MENU** appears on the LCD panel.

NOTE:
Your Tandberg DLT7 Autoloader automatically displays **LdR REAdY** if you do not press a key within 30 seconds.

4.5.1.3. Enabling AUTOCLEAN

The default condition is **AUTOCLEAN OFF**.

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **AUTOCLEAN** appears on the LCD panel.
2. Press the **SELECT** button to select **AUTOCLEAN**. **AC ON** appears on the LCD panel.
3. Press the **SELECT** button to enable **AUTOCLEAN**. **CT 2 (SEL)** blinks on the LCD panel.
4. Place the cleaning cartridge in slot 2, then press the **SELECT** button. Your Tandberg DLT7 Autoloader moves the cleaning cartridge from slot 2 to slot 7.

NOTE:
If a data cartridge is in slot 2 when you press the **SELECT** button, autoloader treats it like a cleaning cartridge and moves it to slot 7.

If slot 7 already contains a cartridge when you press the **SELECT** button, the **DEST FULL** error message appears on the LCD panel and **AUTOCLEAN** is not enabled. If this happens, use the **UNLOAD SLOT** mode to empty slot 7 first, then follow steps 1 through 4 to enable **AUTOCLEAN**.

If you want to cancel while enabling the **AUTOCLEAN** function, press the **MODE** button before you place the cleaning cartridge in slot 2 or press the **SELECT** button. **LdR REAdY** appears on the LCD panel and **AUTOCLEAN** is not enabled.

If you do not place the cleaning cartridge in slot 2 and press the **SELECT** button within 30 seconds of selecting the **AUTOCLEAN** feature, the Diagnostic Menu times out. **LdR REAdY** appears on the LCD panel and **AUTOCLEAN** is not enabled.

The Autoclean feature is disabled until the autoloader places the cleaning cartridge in slot 7. If power is cycled before the autoloader places the cartridge in slot 7, **AUTOCLEAN** remains disabled. Follow steps 1 through 4 again to enable **AUTOCLEAN.**

If a cartridge is in the drive when you place the cleaning cartridge in slot 2 and press the **SELECT** button, a **DRIVE FULL** error appears on the LCD panel and **AUTOCLEAN** remains disabled. This is also true if the Media Picker is full when you press the **SELECT** button. In either case, clear the error by pressing the **MODE** button. Then use **EJECT DRV** Mode to remove the cartridge from the drive or use **EJECT PCKR** Mode to remove the cartridge from the Media Picker before attempting to enable **AUTOCLEAN**.

4.5.1.4. Using AUTOCLEAN

AUTOCLEAN automatically cleans the drive's read/write head whenever the drive issues a Cleaning Requested status. When cleaning is complete, your Tandberg DLT7 Autoloader returns the cleaning cartridge to slot 7.

When **AUTOCLEAN** is enabled, your backup application does not have access to slot 7 and the autoloader appears as a 6-slot loader. This forces the application to remap your Tandberg DLT7 Autoloader. Although slot 7 is unavailable to the application, the slot 7 indicator on the Operator Panel LCD functions normally, showing the presence of a cartridge when cleaning is not being performed.

When **AUTOCLEAN** is enabled, you still have normal access to slot 7 from the front panel, allowing you to recover from an error if the cleaning cartridge gets stuck in the Media Picker.

If the cleaning cartridge is ever in any slot other than 7, **AUTOCLEAN** ***does not work.***

If the drive issues a Cleaning Tape Expired condition during a cleaning operation, **CYCLE AC** appears on the LCD panel. To clear the error condition, press the **MODE** button. Then follow steps 1 through 4 to replace the cleaning cartridge with a new one. This allows **AUTOCLEAN** to remain on. If desired, follow the instructions in the next section to disable **AUTOCLEAN**, then re-enable it using a new cleaning cartridge.

4.5.1.5. Disabling AUTOCLEAN

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **AUTOCLEAN** appears on the LCD panel.
2. Press the **SELECT** button to select **AUTOCLEAN**. **AC OFF** appears on the LCD panel.
3. Press the **SELECT** button to disable **AUTOCLEAN**. The autoloader moves the cleaning cartridge from slot 7 to slot 2. **RMV 2 (SEL)** blinks on the LCD panel.
4. Remove the cleaning cartridge from slot 2, then press the **SELECT** button. **LdR REAdY** appears on the LCD panel.

If slot 2 already contains a cartridge, the **DEST FULL** error message appears on the LCD panel and **AUTOCLEAN** will remain on.

The **AUTOCLEAN** feature remains enabled until your Tandberg DLT7 Autoloader places the cleaning cartridge in slot 2. If you cycle power after the Media Picker picks the cartridge, but before the autoloader place the cartridge in slot 2, **AUTOCLEAN** remains enabled. If this happens, when power returns use **EJECT PCKR** Mode to place the cleaning cartridge in slot 7, then follow steps 1 through 4 in this section to disable **AUTOCLEAN** again.

4.5.1.6. Manual Read/Write Head Cleaning

> NOTE:
> Use this procedure only if your backup application does not include an auto-clean feature and you choose not to use your Tandberg DLT7 Autoloader's **AUTOCLEAN** feature

To clean the drive manually, you must be aware of the present state of your Tandberg DLT7 Autoloader and drive. The drive and storage slot 2 must be empty. If a cartridge is in the drive, use **EJECT DRV** Mode to remove it. If there is a data cartridge in slot 2, remove it. You can then proceed with these instructions.

Your Tandberg DLT7 Autoloader's **CLEAN DRIVE** feature is available on the Diagnostic Menu. To access the Diagnostic Menu, press and hold the **NEXT** button and then press and hold the **MODE** button for approximately 5 seconds. **dIAG MENU** appears on the LCD panel.

> NOTE:
> Your Tandberg DLT7 Autoloader automatically displays **LdR REAdY** if you do not press a key within 30 seconds.

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **CLEAN dRIVE** appears on the LCD panel.
2. Press the **SELECT** button to begin the drive head cleaning process. **CT 2 (SEL)** blinks on the LCD panel.
3. If you have not already done so, place the cleaning cartridge in slot 2, then press the **SELECT** button. The autoloader loads the cleaning cartridge into the drive and cleaning begins. **CLEANING** appears on the LCD panel and the Activity Bars indicate drive activity during cleaning.

NOTE:
If a data cartridge is in slot 2 when you press the **SELECT** button, the autoloader treats it like a cleaning cartridge and loads it into the drive.

If you press the **SELECT** button before placing the cleaning cartridge in slot 2, **CT 2 (SEL)** continues to blink on the LCD panel.

If a cartridge is in the drive when you press the **SELECT** button, the **DRIVE FULL** error appears on the LCD panel. Clear the error by pressing the **MODE** button. Use **EJECT DRV** Mode to remove the cartridge from the drive, then follow steps 1 and 2 again.

When cleaning is complete, the drive automatically ejects the cartridge, and autoloader will places it in slot 2. **RMV 2 (SEL)** blinks on the LCD panel

4. Remove the cleaning cartridge from slot 2 and press the **SELECT** button to return your Tandberg DLT7 Autoloader to **LdR REAdY**.

4.5.2. Cleaning the Enclosure

Clean the outside of your Tandberg DLT7 Autoloader's enclosure with a damp towel. If you use a liquid all-purpose cleaner, apply it to the towel. ***Do not directly spray the enclosure.***

4..6. Troubleshooting and Diagnostics

This chapter contains some general suggestions to aid you in solving problems – should you ever run into them. It also includes information on error codes and the built-in diagnostics.

4.6.1. Installation Problems

Usually, problems encountered during the installation of your Tandberg DLT7 Autoloader are caused by improper SCSI bus configuration, application software configuration errors, or by an incorrectly configured operating system. If the application software that you are using is not communicating with your autoloader after installation, check the following:

- **SCSI IDs:** Make sure that the IDs you selected for the Tandberg DLT7 Autoloader robotics and Tandberg DLT1 drive are not used by any other SCSI device on that bus, including the SCSI host adapter. See page 4- 8 for more information.
- **SCSI Cabling:** Verify that all SCSI cables are securely connected at both ends and that jackscrews or bail locks are secured. Check the length and integrity of your SCSI cabling. The total length of all cables connected to a SCSI-2 bus must not exceed 19 feet (6 meters) for an SE bus, 40 feet (12 meters) for an LVD bus with multiple devices, or 82 feet (25 meters) for an LVD bus with a single device. The length of the internal SCSI cabling inside your DLT Autoloader is 1 foot (30 cm). This length must be included in any calculations of cable length. Try replacing suspect cables with known good cables.
- **Termination:** Make sure that all SCSI buses are properly terminated.

- **Compatibility:** Ensure that your Tandberg DLT7 Autoloader and its drive are compatible with the SCSI host adapter and backup application you plan to use. For a list of compatible SCSI adapters and application software, check with your backup application vendor.
- **SCSI Host Adapter Card Installation:** Verify that you have installed your SCSI host adapter card correctly. Refer to the documentation that came with your host adapter for installation and troubleshooting instructions. Pay particular attention to any steps describing the settings of various jumpers and/or switches on the host adapter. Make sure that the host adapter is seated fully in the motherboard slot.
- **Backup Application Installation:** Refer to the documentation included with your backup application for instructions on how to verify proper installation.

4.6.2. Loader and Drive Operational Problems

Many problems with the operation of your Tandberg DLT7 Autoloader and/or drive occur when the drive is not cleaned when needed or when you use invalid data cartridges. If you have been successfully using the backup application and your Tandberg DLT7 Autoloader in the past, but are now experiencing problems reading and writing data, check the following items:

- If you are writing data, make sure that the cartridge is write enabled (move the write-protect switch to the enabled position).
- If the cartridge you are using has been in use for a long time or if it has been used frequently, try using a new cartridge.

4.6.3. Diagnostic Menu

The Diagnostic Menu provides access to testing, firmware version display and upgrading, and cleaning features built into your Tandberg DLT7 Autoloader.

To access the **DIAGNOSTIC MENU,** press and hold the **NEXT** button and then press and hold the **MODE** button for approximately 5 seconds. **dIAG MENU** appears on the LCD panel.

NOTE:
Your Tandberg DLT7 Autoloader automatically displays **LdR REAdY** if you do not press a key within 30 seconds.

The following functions are available under the Diagnostic Menu:

LCD Panel Display	Description
DSP FW	This function displays the revision of the operating firmware from your Tandberg DLT7 Autoloader microprocessors and drive.
SIGN ON	Use this function if your backup application does not support the Tandberg DLT7 Autoloader, but does support the SCALAR library.
CHG MODE	Use this function to select **RANDOM** or **SEQUENTIAL** Mode.
CYCLE TEST	This function allows you to verify the functionality of the Autoloader robotics. **CYCLE TEST** exercises the autoloader robotics by executing a sequence of pick and place operations, moving the cartridges between the slots and the drive.
CLEAN DRV	The **CLEAN DRV** function allows you to clean the drives read/write head manually. Use this function if your backup application does not support an automatic cleaning cycle and you do not want to dedicate slot 7 to the autoloader's **AUTOCLEAN** feature.
AUTOCLEAN	**AUTOCLEAN** provides an automatic cleaning cycle. Use **AUTOCLEAN** only if your backup application does not support an automatic cleaning cycle. Slot 7 is dedicated to the cleaning cartridge whenever you endable **AUTOCLEAN**, reducing the autoloader's capacity to 6 data cartridges.
LOAD FW	This function allows you to upgrade the Tandberg DLT7 Autoloader's firmware via the SCSI bus.
DSP COUNTS	The DLT Autoloader keeps track of how many times certain events have occurred. The **DSP COUNTS** function displays these numbers.
UPG DRV FW	This function allows you to upgrade the drive firmware using a Code Upgrade cartridge.

Table 11: Diagnostic Menu

4.6.3.1. DISPLAY FIRMWARE

This function displays the revision of the operating firmware from your Tandberg DLT7 Autoloader microprocessors and drive.

To display the firmware versions, follow these steps:

1. After entering the **DIAG MENU**, press the **MODE** button until **dSP FW** appears on the LCD Panel.
2. Press the **SELECT** button. **dSP LdR FW** appears on the LCD panel.
3. Press the **SELECT** button to display the revision for the loader firmware. **Ld FW nnnn** (where **nnnn** is the revision number of the firmware) appears on the LCD panel.
4. Press the **NEXT** button. **dSP dRV FW** appears on the LCD panel.
5. Press the **SELECT** button to display the revision of the drive firmware. **dR FW nnnn** (where **nnnn** is the revision number of the firmware) appears on the LCD panel.
6. Press the **NEXT** button. **dSP MTN FW** appears on the LCD panel.
7. Press the **SELECT** button to display the firmware revision for the Motion firmware. **MTN FW nn** (where **nn** is the revision number of the firmware) appear on the LCD panel.
8. Press the **NEXT** button. **dSP FP FW** appears on the LCD panel.
9. Press the **SELECT** button to display the firmware revision for the front panel firmware. **FP FW nn** (where **nn** is the revision number of the firmware) appears on the LCD panel.
10. Press the **NEXT** button. **dSP bT FW** appears on the LCD panel.
11. Press the **SELECT** button to display the firmware revision for the boot firmware. **bT FW nn** (where **nn** is the revision number of the firmware) appears on the LCD panel.
12. Press the **SELECT** button. **LdR REAdY** appears on the LCD panel.

4.6.3.2. SIGN ON

Use this function if your backup application does not support the Tandberg DLT7 Autoloader, but does support the SCALAR library.

To use this feature, follow these steps:

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **SIGN ON** appears on the LCD panel.
2. Press the **SELECT** button to display the current sign-on string.
3. Press the **NEXT** or **PREVIOUS** button to toggle the sign-on string between **FASTSTOR** and **SCALAR**.
4. Press the **SELECT** button. **LdR REAdY** appears on the LCD panel.

4.6.3.3. CHANGE MODE

Your Tandberg DLT7 Autoloader is capable of operating in either Random-Access or Sequential-Access modes.

When in Random-Access mode, the Tandberg DLT7 Autoloader allows software selection of *any* data cartridge in *any* order. You can logically divide cartridge usage to satisfy particular data storage needs. For example, you can assign one or more cartridges to specific data functions, such as certain directories or network servers, or you can assign specific cartridges to individual users or groups, such as Sales or Engineering.

When in Sequential-Access mode, all cartridges present are considered to be a single volume. The Tandberg DLT7 Autoloader firmware predefines the selection of the cartridges. After initialization, the firmware always loads the first cartridge found, counting from 1 through 7, into the drive. After the backup software has filled the first cartridge and issued an eject command the Tandberg DLT7 Autoloader automatically unloads the drive, returns the cartridge to its storage slot, and then loads the next cartridge in order. Empty storage slots are ignored. Your Tandberg DLT7 Autoloader continues this process until it has used the last cartridge in the sequence. It is important to note that while in Sequential-Access mode, your Tandberg DLT7 Autoloader robotics are not logically connected to the SCSI bus and do not respond to SCSI commands.

To change modes, follow these steps:

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **CHG MOdE** appears on the LCD panel.
2. Press the **SELECT** button to display the current mode.
3. Press the **NEXT** or **PREVIOUS** button to toggle the mode between **SEQUENTIAL** and **RANdOM**.
4. Press the **SELECT** button. **LdR REAdY** appears on the LCD panel.

When in Sequential-Access mode, your Tandberg DLT7 Autoloader replaces the **LdR REAdY** message with a **SEQ REAdY** message.

If you press the **MODE** button while the Tandberg DLT7 Autoloader is in Sequential-Access mode, the **STOP SEQ** menu appears on the LCD. If you press the **SELECT** button while in this menu, the **SEQ ENdING** message replaces the **LdR REAdY** message and Sequential mode ends after the autoloader unloads the current cartridge. Pressing the **MODE** button after the cartridge is unloaded returns your Tandberg DLT7 Autoloader to the normal menu structure.

When the **SEQ ENdING** message appears on the LCD panel, pressing the **MODE** button before the current cartridge is unloaded displays the **RESUME SEQ** menu. Pressing the **SELECT** button while in this menu cancels the previous **STOP SEQ** request and Sequential mode continues with the current cartridge as if you had never requested **STOP SEQ**.

When the last cartridge in the volume has been filled, the **SEQ dONE** message replaces the **SEQ REAdY** message on the LCD panel.

When the **SEQ dONE** message appears on the LCD panel, pressing the **MODE** button displays the **START SEQ** menu. Pressing the **SELECT** button while in this menu restarts Sequential mode. Pressing the **MODE** button while in this menu returns your Tandberg DLT7 Autoloader to the normal menu structure.

4.6.3.4. CYCLE TEST

This function allows you to verify the functionality of the Autoloader robotics. **CYCLE TEST** exercises the autoloader robotics by executing a sequence of pick and place operations, moving the cartridges between the slots and the drive. Observe these guidelines for CYCLE TEST:

- Before executing **CYCLE TEST**, verify that the drive is empty. If necessary, use **EJECT DRIVE** Mode to remove the cartridge from the drive.
- Before executing **CYCLE TEST**, verify that all seven cartridge slots have cartridges installed. If required, install additional cartridges.
- If **AUTOCLEAN** is enabled and a cleaning cartridge is in slot 7, **CYCLE TEST** does not use slot 7.

To run CYCLE TEST, follow these steps:

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **CYCLE TEST** appears on the LCD panel.
2. Press the **SELECT** button. **CYCLES 1** appears on the LCD panel.
3. Press the **SELECT** button to have the autoloader execute one cycle of **CYCLE TEST**. To execute more than one cycle, press the **NEXT** button until the desired number of cycles is displayed, then press the **SELECT** button. If you want the autoloader to execute **CYCLE TEST** continually, press the **PREVIOUS** button until **CYCLES 0** is displayed, then press the **SELECT** button. If your Tandberg DLT7 Autoloader is executing **CYCLE TEST** continually, you must press and hold the **MODE** button for approximately 10 seconds to quit.

During **CYCLE TEST** execution, the Tandberg DLT7 Autoloader moves the cartridges from one slot to another and places each cartridge into the drive. When **CYCLE TEST** is completed, your Tandberg DLT7 Autoloader automatically returns to **LdR REAdY**.

4.6.3.5. CLEAN DRIVE

The following procedure is to be used only if your application does not support an auto clean cycle and you choose not to use the DLT Autoloader **AUTOCLEAN** feature.

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **CLEAN dRIVE** appears on the LCD panel.
2. Press the **SELECT** button to begin the drive read/write head cleaning process. **CT 2 (SEL)** blinks on the LCD panel.

3. If you have not already done so, place the cleaning cartridge in slot 2, then press the **SELECT** button. The autoloader loads the cleaning cartridge into the drive and cleaning begins. **CLEANING** appears on the LCD panel and the Activity Bars indicate drive activity during cleaning.

NOTE:
If a data cartridge is in slot 2 when you press **SELECT**, autoloader treats it like a cleaning cartridge and loads it into the drive.

If you press the **SELECT** button before placing the cleaning cartridge in slot 2, **CT 2 (SEL)** continues to blink on the LCD panel.

If a cartridge is in the drive when you press the **SELECT** button, the **DRIVE FULL** error appears on the LCD panel. Clear the error by pressing the **MODE**

button. Use **EJECT DRV** Mode to remove the cartridge from the drive, then follow steps 1 and 2 again.

When cleaning is complete, the drive automatically ejects the cartridge, and autoloader will places it in slot 2. **RMV 2 (SEL)** blinks on the LCD panel

4. Remove the cleaning cartridge from slot 2 and press the **SELECT** button to return your Tandberg DLT7 Autoloader to **LdR REAdY**.

4.6.3.6. AUTOCLEAN

The **AUTOCLEAN** function is for use with application software that does not support automated cleaning of the drive head. Applications that support automated cleaning manage tape location and use, including that of the cleaning cartridge. Do not use the **AUTOCLEAN** function if your application software supports automated cleaning cycles.

4.6.3.7. Enabling AUTOCLEAN

The default condition is **AUTOCLEAN OFF**.

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **AUTOCLEAN** appears on the LCD panel.
2. Press the **SELECT** button to select **AUTOCLEAN**. **AC ON** appears on the LCD panel.
3. Press the **SELECT** button to enable **AUTOCLEAN**. **CT 2 (SEL)** blinks on the LCD panel.
4. Place the cleaning cartridge in slot 2, then press the **SELECT** button. Your Tandberg DLT7 Autoloader moves the cleaning cartridge from slot 2 to slot 7.

NOTE:
If a data cartridge is in slot 2 when you press the **SELECT** button, autoloader treats it like a cleaning cartridge and moves it to slot 7.

If slot 7 already contains a cartridge when you press the **SELECT** button, the **DEST FULL** error message appears on the LCD panel and **AUTOCLEAN** is not enabled. If this happens, use the **UNLOAD SLOT** mode to empty slot 7 first, then follow steps 1 through 4 to enable **AUTOCLEAN**.

If you want to cancel while enabling the **AUTOCLEAN** function, press the **MODE** button before you place the cleaning cartridge in slot 2 or press the **SELECT** button. **LdR REAdY** appears on the LCD panel and **AUTOCLEAN** is not enabled.

If you do not place the cleaning cartridge in slot 2 and press the **SELECT** button within 30 seconds of selecting the **AUTOCLEAN** feature, the Diagnostic Menu times out. **LdR REAdY** appears on the LCD panel and **AUTOCLEAN** is not enabled.

The Autoclean feature is disabled until the autoloader places the cleaning cartridge in slot 7. If power is cycled before the autoloader places the cartridge in slot 7, **AUTOCLEAN** remains disabled. Follow steps 1 through 4 again to enable **AUTOCLEAN.**

If a cartridge is in the drive when you place the cleaning cartridge in slot 2 and press the **SELECT** button, a **DRIVE FULL** error appears on the LCD panel and **AUTOCLEAN** remains disabled. This is also true if the Media Picker is full when you press the **SELECT** button. In either case, clear the error by pressing

the **MODE** button. Then use **EJECT DRV** Mode to remove the cartridge from the drive or use **EJECT PCKR** Mode to remove the cartridge from the Media Picker before attempting to enable **AUTOCLEAN**.

4.6.3.8. Using AUTOCLEAN

AUTOCLEAN automatically cleans the drive's read/write head whenever the drive issues a Cleaning Requested status. When cleaning is complete, your Tandberg DLT7 Autoloader returns the cleaning cartridge to slot 7.

When **AUTOCLEAN** is enabled, your backup application does not have access to slot 7 and the autoloader appears as a 6-slot loader. This forces the application to remap your Tandberg DLT7 Autoloader. Although slot 7 is unavailable to the application, the slot 7 indicator on the Operator Panel LCD functions normally, showing the presence of a cartridge when cleaning is not being performed.

When **AUTOCLEAN** is enabled, you still have normal access to slot 7 from the front panel, allowing you to recover from an error if the cleaning cartridge gets stuck in the Media Picker.

If the cleaning cartridge is ever in any slot other than 7, **AUTOCLEAN** ***does not work.***

If the drive issues a Cleaning Tape Expired condition during a cleaning operation, **CYCLE AC** appears on the LCD panel. To clear the error condition, press the **MODE** button. Then follow steps 1 through 4 to replace the cleaning cartridge with a new one. This allows **AUTOCLEAN** to remain on. If desired, follow the instructions in the next section to disable **AUTOCLEAN**, then re-enable it using a new cleaning cartridge.

4.6.3.9. Disabling AUTOCLEAN

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **AUTOCLEAN** appears on the LCD panel.
2. Press the **SELECT** button to select **AUTOCLEAN**. **AC OFF** appears on the LCD panel.
3. Press the **SELECT** button to disable **AUTOCLEAN**. The autoloader moves the cleaning cartridge from slot 7 to slot 2. **RMV 2 (SEL)** blinks on the LCD panel.
4. Remove the cleaning cartridge from slot 2, then press the **SELECT** button. **LdR REAdY** appears on the LCD panel.

If slot 2 already contains a cartridge, the **DEST FULL** error message appears on the LCD panel and **AUTOCLEAN** will remain on.

The **AUTOCLEAN** feature remains enabled until your Tandberg DLT7 Autoloader places the cleaning cartridge in slot 2. If you cycle power after the Media Picker picks the cartridge, but before the autoloader place the cartridge in slot 2, **AUTOCLEAN** remains enabled. If this happens, when power returns use **EJECT PCKR** Mode to place the cleaning cartridge in slot 7, then follow steps 1 through 4 in this section to disable **AUTOCLEAN** again.

4.6.3.10. LOAD FIRMWARE

This function allows you to upgrade the Tandberg DLT7 Autoloader's firmware via the SCSI bus.

Whenever new firmware for your Tandberg DLT7 Autoloader is released, complete instructions on how to use the **LOAD FIRMWARE** function to perform the upgrade is included on the firmware diskette.

4.6.3.11. DISPLAY COUNTS

The DLT Autoloader keeps track of how many times certain events have occurred. The **DSP COUNTS** function displays these numbers.

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **dSP COUNTS** appears on the LCD panel.
2. Press the **SELECT** button to access the first event. **FRT PK (SEL)** appears on the LCD panel.
3. Press the **SELECT** button again. Your Tandberg DLT7 Autoloader displays the number of times that it has picked a cartridge from any of the front slots.
4. Press the **NEXT** button to access the next event.

Your Tandberg DLT7 Autoloader keeps track of the following events:

- Front Pick Cartridge
- Rear Pick Cartridge
- Drive Pick Cartridge
- Front Place Cartridge
- Rear Place Cartridge
- Drive Place Cartridge
- Drive Door Retries
- Front Pick Retries
- Rear Pick Retries
- Drive Pick Retries
- Front Place Retries
- Rear Place Retries
- Drive Place Retries

Press the **SELECT** button when **dRV dR RE** is displayed to return your Tandberg DLT7 Autoloader to **LdR READY**. Press the **MODE** button at any time to return your Tandberg DLT7 Autoloader to **LdR READY**.

4.6.3.12. UPGRADE DRIVE FIRMWARE

This function allows you to upgrade the drive firmware using a Code Upgrade cartridge.

NOTE:
Follow this procedure only when you are upgrading the drive firmware using a Code Upgrade cartridge.

1. After entering the **DIAG MENU**, press and hold the **MODE** button until **UPG DRV FW** appears on the LCD panel.
2. Press the **SELECT** button to begin the drive firmware upgrade process. **CT 2 (SEL)** blinks on the LCD panel.
3. If your have not already done so, place a Code Upgrade cartridge in slot 2 then press the **SELECT** button. If you press the **SELECT** button before placing the Code Upgrade tape in slot 2, **UPG DRV FW** appears momentarily on the LCD panel and then **CT 2 (SEL)** blinks on the LCD panel again.

Your Tandberg DLT7 Autoloader places the drive in “prepare for firmware upgrade via tape” mode. The autoloader moves the Code Upgrade tape to the drive and the upgrade process begins. **UPDATING** appears on the LCD panel, the three front panel LEDs alternate between **POWER** on, **ACTIVITY** off, **ALARM** on, **POWER** off, **ACTIVITY** on, **ALARM** off, and the Activity Bars indicate drive activity.

NOTE:
The **POWER** button is disabled during the upgrade.

When the update process is completed, your Tandberg DLT7 Autoloader automatically unloads the Code Upgrade cartridge and returns it to slot 2. **RMV 2 (SEL)** then blinks on the LCD panel.

4. Remove the Code Upgrade cartridge from slot 2, then press the **SELECT** button to return the autoloader to **LdR REAdY**.

If the **DRIVE PGRM** message and the error indicator **E** appear on the LCD panel after several minutes, perform the following:

- Verify that the cartridge is a valid Code Upgrade cartridge and not a data cartridge or cleaning cartridge.
- If you believe that the Code Upgrade cartridge is valid, repeat the update process. If your Tandberg DLT7 Autoloader displays the same error message, call your Technical Support for assistance.

4.7. Tandberg DLT Autoloader Error Messages

If an error occurs during operation of your Tandberg DLT7 Autoloader, the autoloader stops the current operation and displays an error message on the top line of the LCD panel. After you solve the problem, cycle power on your Tandberg DLT7 Autoloader and try the last operation again.

4.7.1. Error Message Listing

A description of each of the DLT Autoloader error messages is provided in the following table:

Error Display	Description
SERIAL RCV	Inter-processor communication error
SRC EMPTY *	The source location is empty
DEST FULL *	The destination location is full
CPU RX ERR	The Motion CPU is not ready to receive
CPU TX ERR	The Motion CPU is not ready to transmit
SLOT EMPTY	No slot beam detected
PWR SWITCH	The front power switch was pressed
HALT	The Motion CPU has been halted by a low ACT line
CAM LIMIT	A cam limit has been reached without tripping a sensor
JAW SENSOR	A jaw sensor was tripped
INV MOV OP *	An invalid move operation occurred
REAR TAPE	A rear tape sensor was not tripped
FRONT TAPE	A front tape sensor was not tripped
REAR SLOT	A rear slot sensor was not tripped
FRONT SLOT	A front slot sensor was not tripped
PCKR FULL *	The Media Picker is full
PCKR EMPTY *	The Media Picker is empty
SLOT FULL *	Media present in slot
NVM SELECT	NVRAM selection failure
NVM WRITE	NVRAM write failure
DRIVE EJCT	Drive failed to eject media
DRIVE LOAD	Unable to load media into drive
DRIVE UNLD *	Drive not logically unloaded
DRIVE HNDL	Drive ‘Operate Handle’ timeout
DRIVE BUSY	Drive busy, cannot unload cartridge
DRIVE PGRM	Attempt to set drive parameters failed
DRIVE DOOR	Drive door stepper motor limit
DRIVE FULL *	The drive was full
CT FAILED	Cleaning tape failed to clean drive
DRIVE POST	Drive failed its POST
ROBOT POST	Robotics failed its POST

* These errors do not appear on the LCD panel if the error occurred during SCSI interaction.

Table 12: Tandberg DLT7 Autoloader Error Messages

During the Tandberg DLT7 Autoloader POST, if the **CT FAILED**, **DRIVE BUSY**, **DRIVE DOOR**, **DRIVE EJCT**, **DRIVE HNDL**, **DRIVE LOAD**, **DRIVE PGRM**, or **DRIVE UNLD** errors occur, **dRIVE POST** (error code 7F) appear son the LCD panel. All other errors occurring during the Tandberg DLT7 Autoloader POST display a **ROBOT POST** (error code 81) message.

5. Updating Your Drive Firmware

5.1. Chapter Overview

This chapter explains how to update your Tandberg DLT1 drive's firmware (microcode) from a DLTtape cartridge or from a file on the host server or workstation.

5.2. Firmware Update Overview

Your Tandberg DLT1 tape drive can automatically update the drive's firmware directly from a DLTtape cartridge containing the appropriate information. Your Tandberg DLT1 drive can also update the drive's firmware from the host server or workstation. See the WRITE BUFFER command in the *Tandberg DLT1 SCSI Interface – Functional Specifications.*

CAUTION:
During the firmware update process, when the new firmware/microcode is actually being programmed into the Flash EEPROM, a power failure – but not a Bus Reset – causes the drive's controller module to become unstable. During a firmware update, take reasonable precautions to prevent a power failure.

5.3. Creating a Code Update Cartridge

To perform the code update, you need a DLTtape IV cartridge and a copy of the firmware image. This image must be byte-written without compression onto the tape You must copy the firmware image to the tape instead of using a backup utility to transfer it to the tape.

*5.3.1. UN*X Systems*

You can use the FTP utility to transfer the binary firmware image file onto the UN*X system. Be sure to specify "type image" before performing the *get* or *put* operation. Doing so prevents extra characters from being added to the image file, which would make the image file invalid. The image file must be exactly 1286*512 Bytes in size. The tape must also be uncompressed.

5.4. Updating the Firmware

To update your Tandberg DLT1 drive's firmware, follow the steps in this section.

CAUTION:
Never turn off your Tandberg DLT1 drive or the host server or workstation during the firmware update process. Doing so can damage the drive's controller hardware.

1. Locate the DLTtape cartridge on which you placed the firmware image file.
2. If there is a DLTtape cartridge in your Tandberg DLT1 drive, remove it.
3. Press and hold the **Eject** button on your Tandberg DLT1 drive's front panel until the Write Protected LED begins to blink, typically about six seconds.

NOTE:
If the Write Protected LED does not blink, make sure Power-On Self-Test (POST) completed successfully, ensure there is not a DLTtape cartridge in the drive, and repeat step 3.

4. Press and hold the **Eject** button again within four seconds until the In Use and Write Protected LEDs both blink. At this point, the drive is in firmware update mode.

NOTE:
If the In Use and Write Protected LEDs do not both blink, wait until the Write Protected LED stops blinking and return to step 2. Repeated failure at this point indicates that the drive and its controller hardware are not communicating properly. If this is the case, code update is not possible. Call Technical Support for repair service.

5. Insert the code update cartridge into the drive. The drive temporarily turns off the In Use and Write Protected LEDs while it reads the cartridge and verifies that the firmware image file is valid. This process may take several minutes to complete.

If the drive's code is up-to-date, the drive cancels code update mode and the process is complete.

If the drive's code is not up-do-date, the drive reads the code image file from the cartridge. The In Use and Write Protected LEDs flash alternately during the update process, which typically takes two or three minutes.

When the drive finishes reading the code image file from the update cartridge, the drive rewinds the tape to the beginning (BOT), resets, and performs a POST. The drive then ensures that the code image file is valid. If so, it updates the controller's flash EEPROM. The In Use and Write Protected LEDs flash alternately during the update process.

6. If the firmware update process completes successfully, the drive ejects the Code Upgrade cartridge. Your Tandberg DLT1 drive is now ready to use with the new code.

NOTE:
If the drive does not eject the Code Upgrade cartridge, the firmware update failed. Refer to the next section for troubleshooting information.

5.4.1. Code Upgrade Troubleshooting

If the code upgrade failed, the drive does not eject the Code Upgrade cartridge at the end of the process. Refer to Table 13 for troubleshooting information.

Problem	Indications/Solution
1. The cartridge is not a valid Code Upgrade cartridge. 2. The cartridge does not contain a valid code upgrade image file.	**Indications:** The drive does not attempt to update the code. The In Use and Write Protected LEDs do not blink. The drive resets and leaves the cartridge loaded to indicate that the code update did not succeed. No damage to the drive or cartridge results. **Solution:** Make a valid Code Upgrade cartridge to solve this problem
The cartridge contains a valid code upgrade image file, but the flash EEPROM programming process fails.	The drive's controller hardware is probably damaged and must be replaced. The drive resets and runs POST, which fails if the flash EEPROM does not contain a valid code image. If this occurs, you must repair the drive before using it again. Call Technical Support for repair service.

Table 13: Code Upgrade Troubleshooting

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